

APPENDIX T2

NORTHWEST REGION TRAFFIC OPERATIONS REDBOOK SECTIONS G & H

I-405, SR520 to SR522 Stage 1 (Kirkland Stage 1)

Draft RFP March 22, 2005



Draft #7

<u>SECTION G</u>-NWR STRIPING AND SIGNING DRAWINGS (LAYOUTS AND DETAILS)

Freeway/Expressway Mainline and Ramp –	
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SECTION H -NWR HOV STRIPING AND SIGNING DRAWINGS (LAYOUTS AND DETAILS)

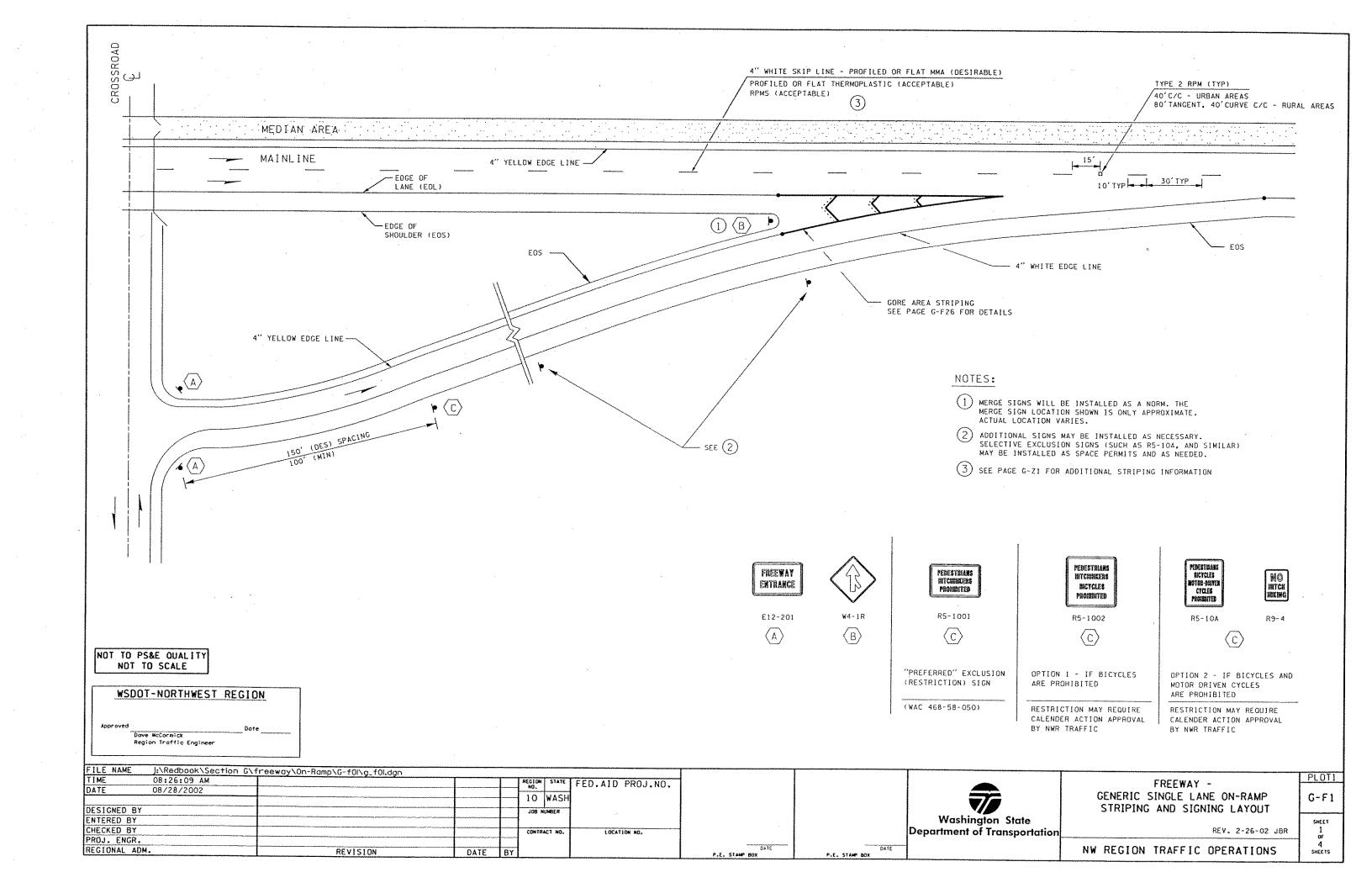
Freeway/Expressway Mainline and Ramp –	
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File Plot Name -	

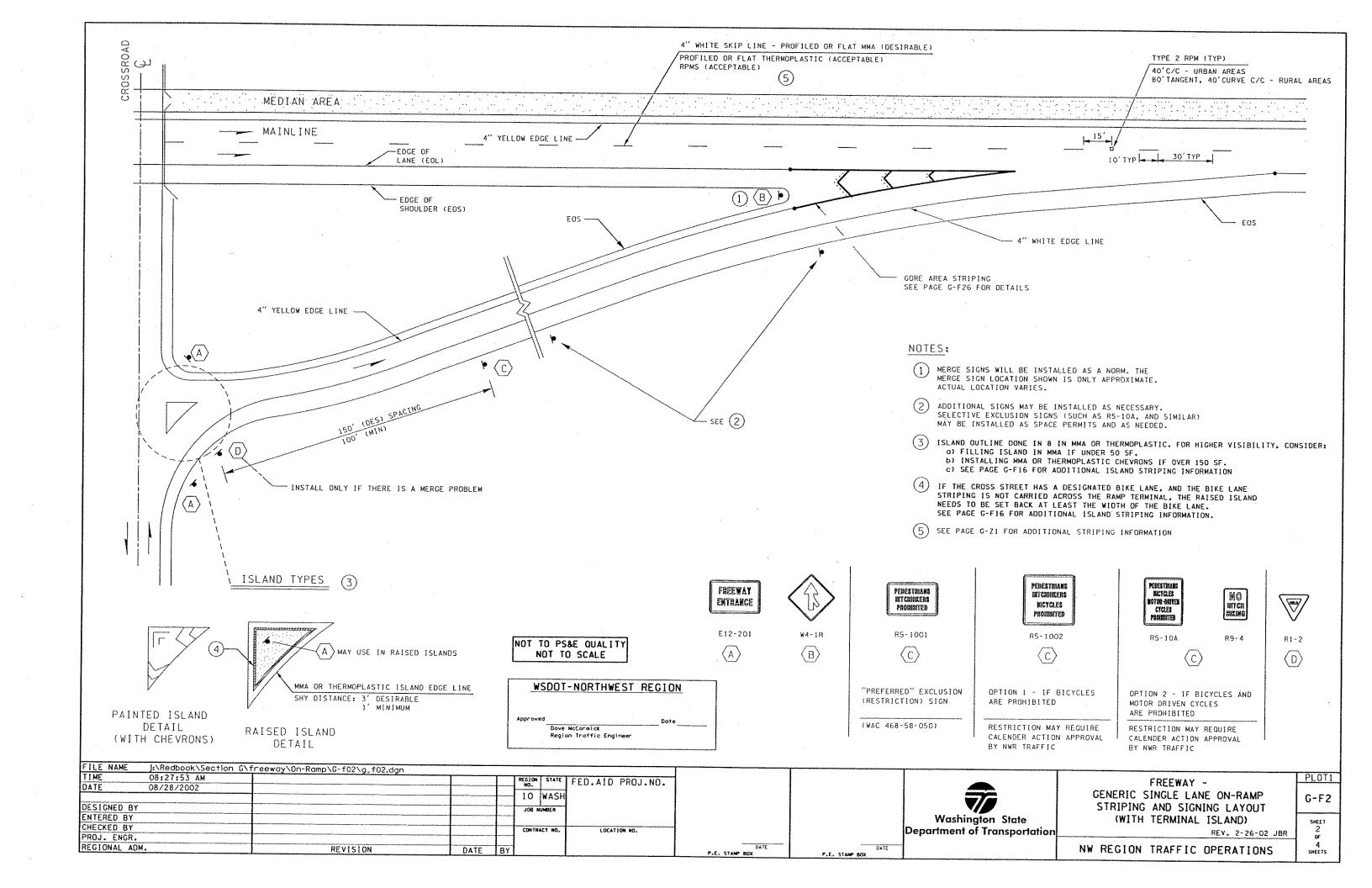
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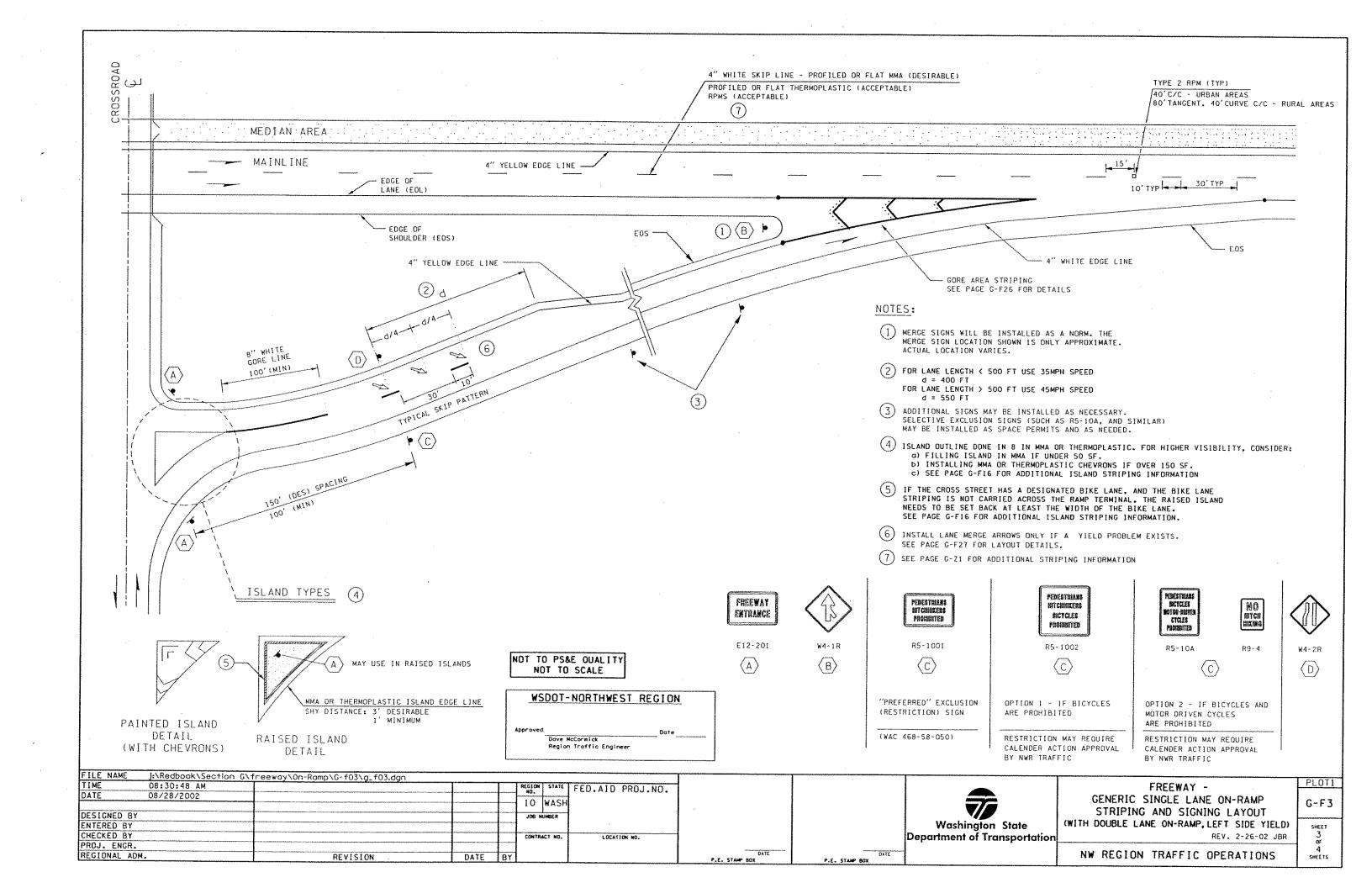
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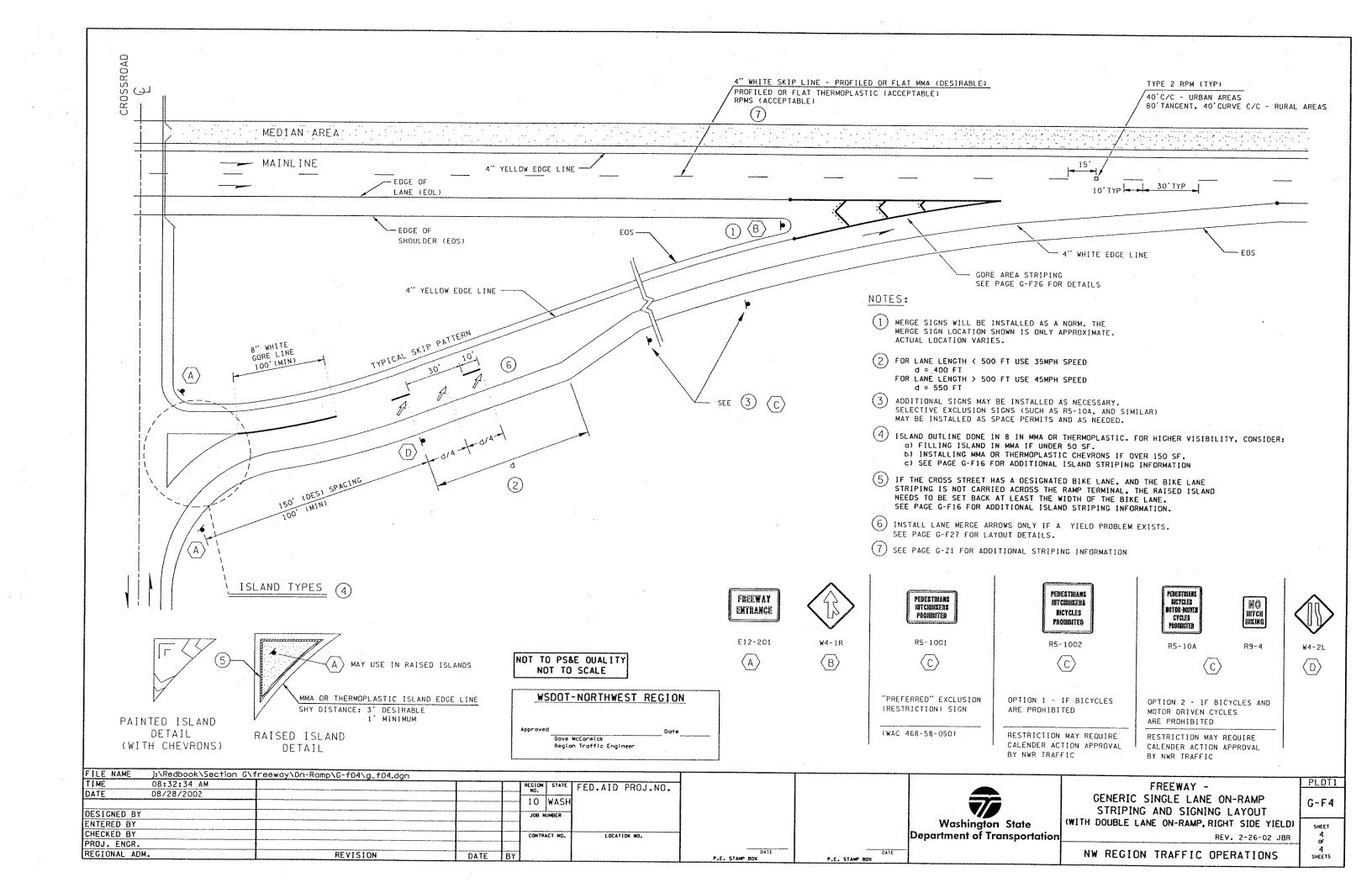
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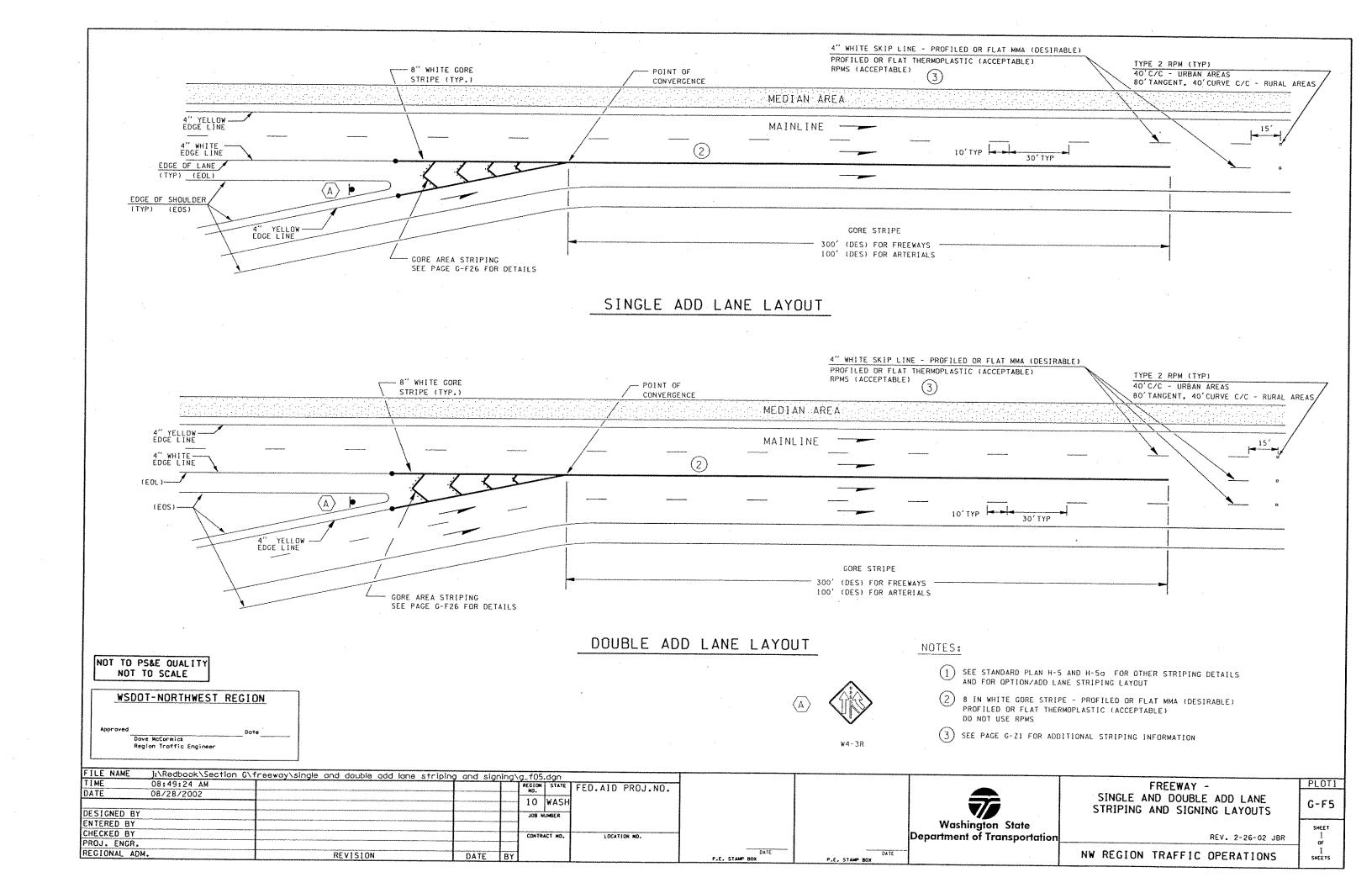
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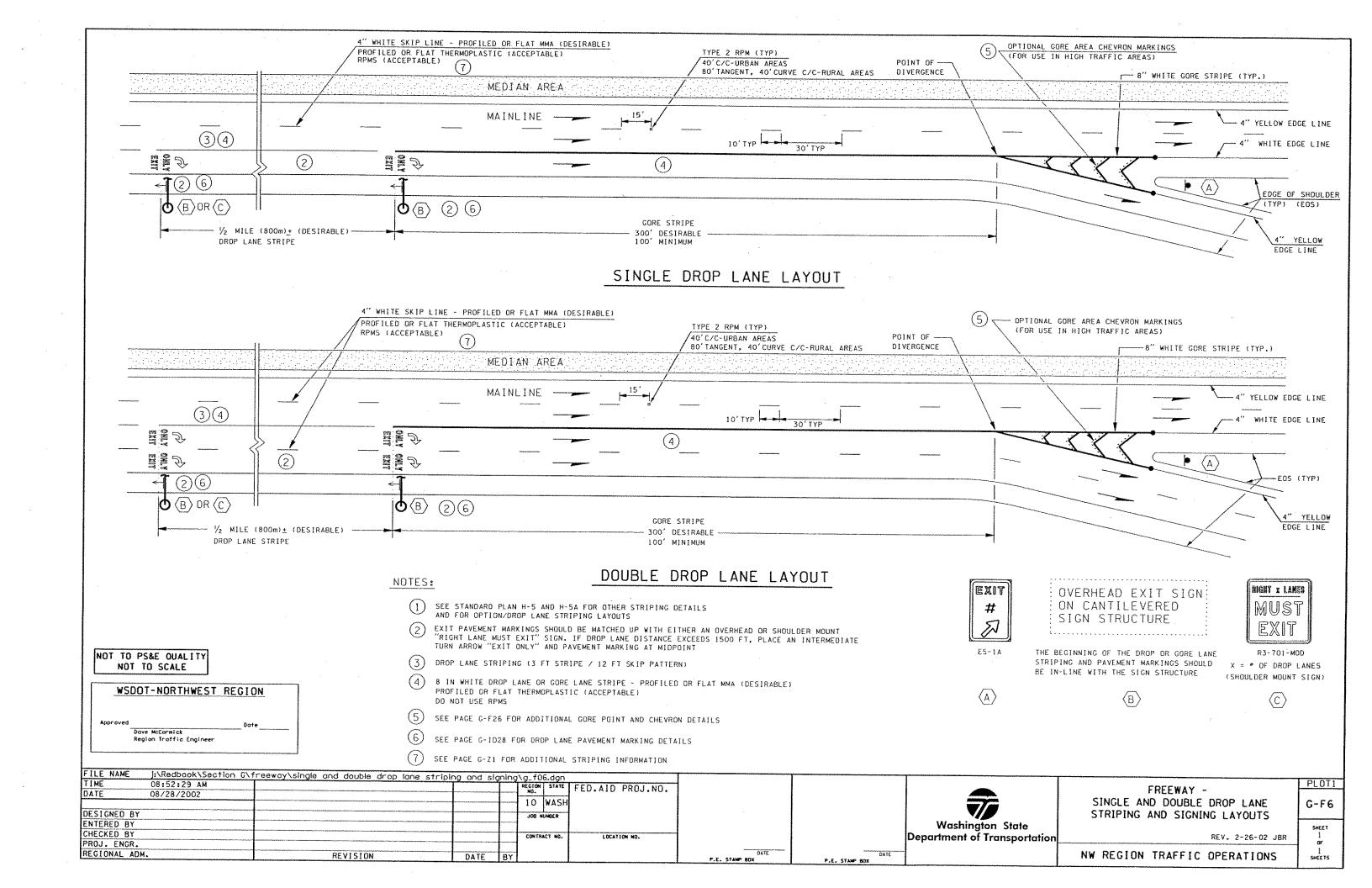


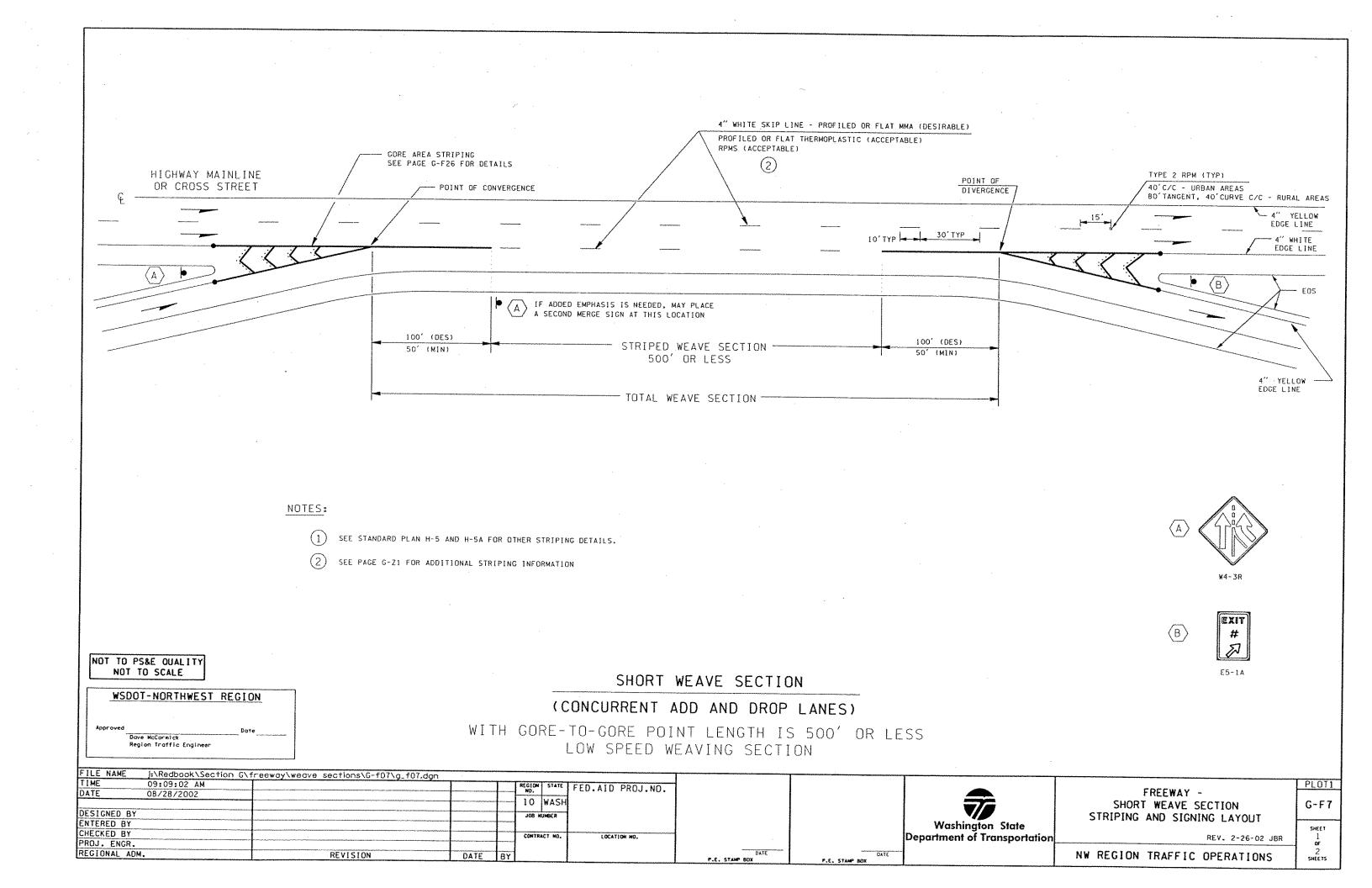


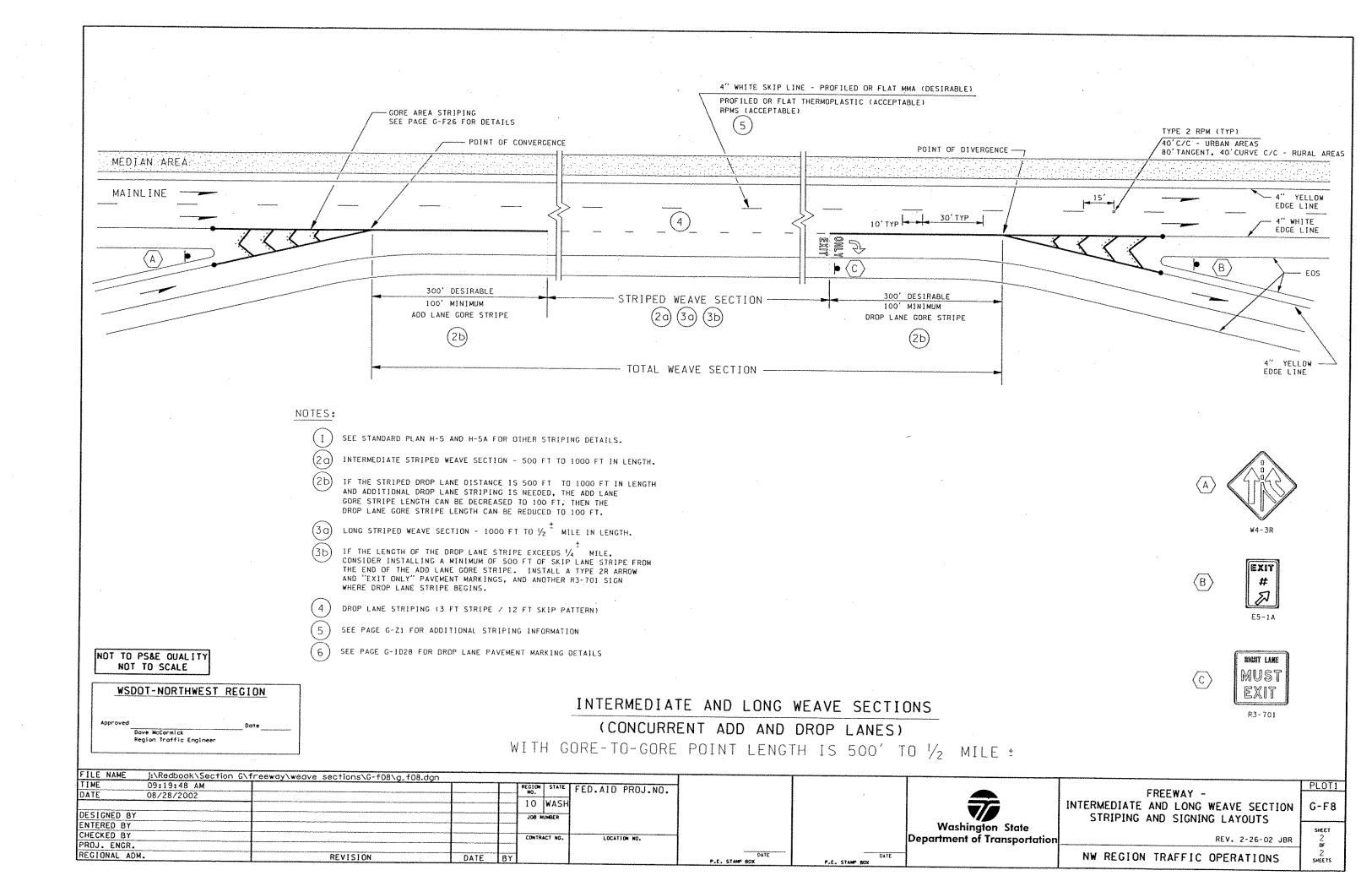


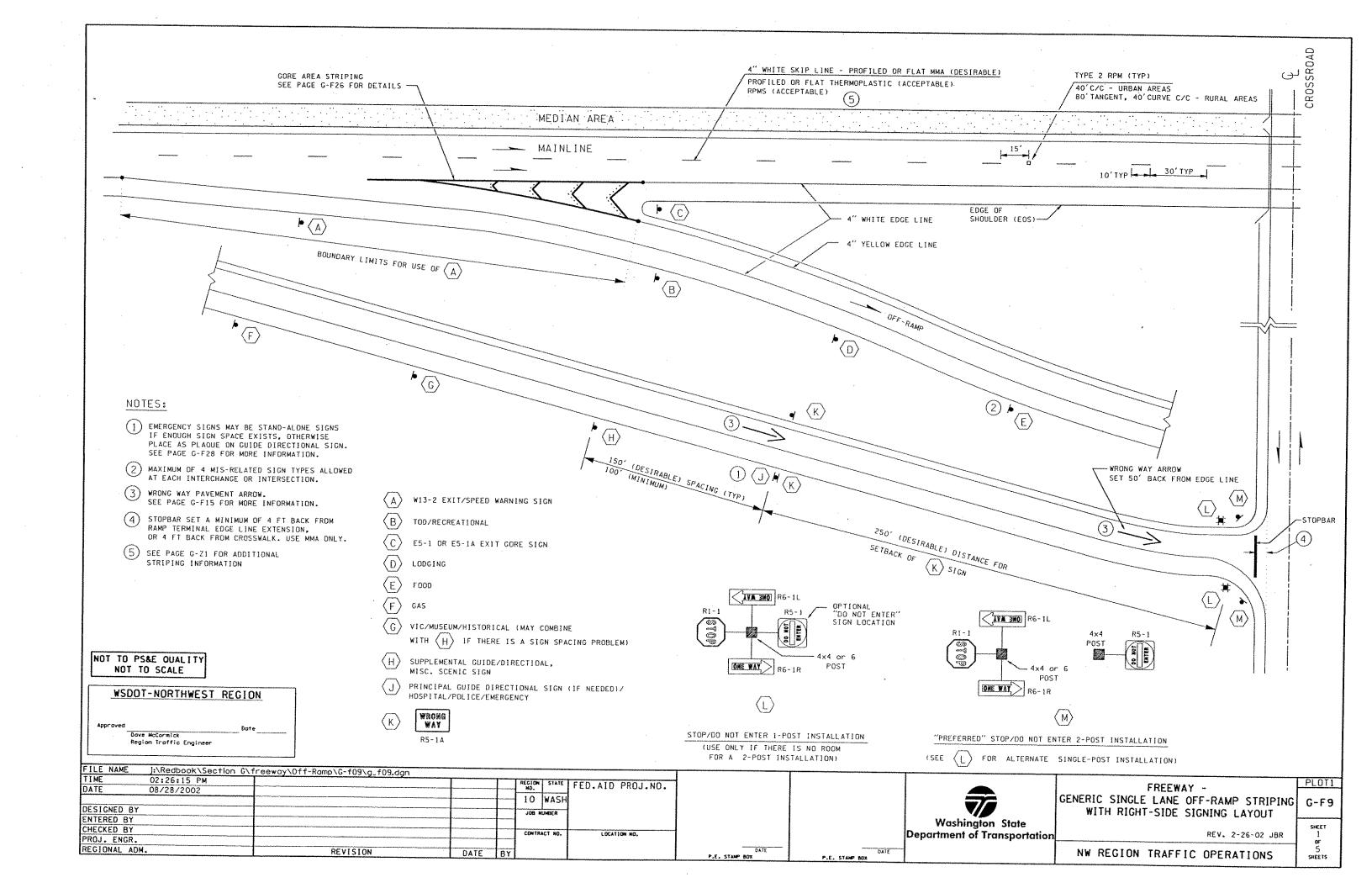


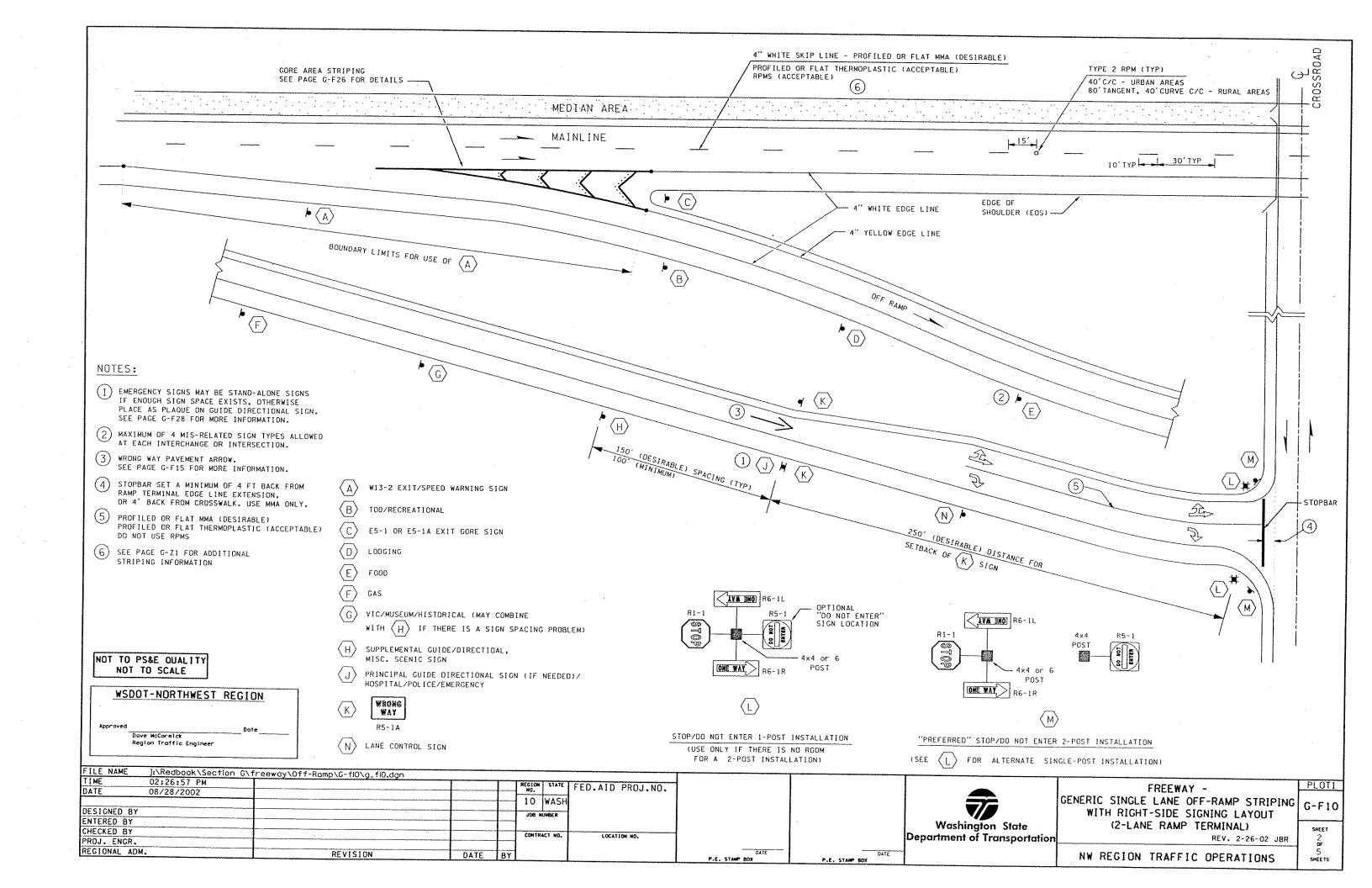


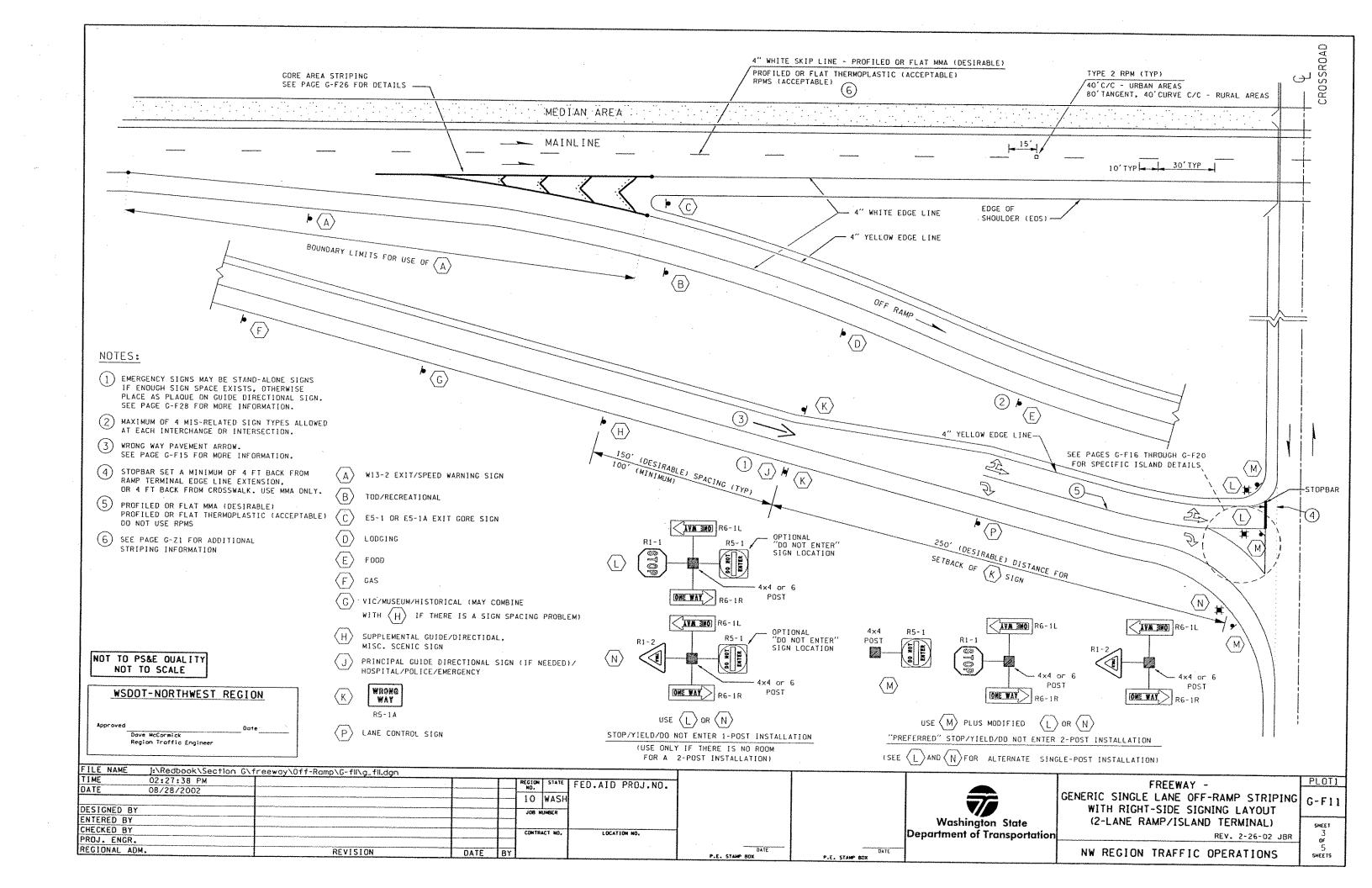


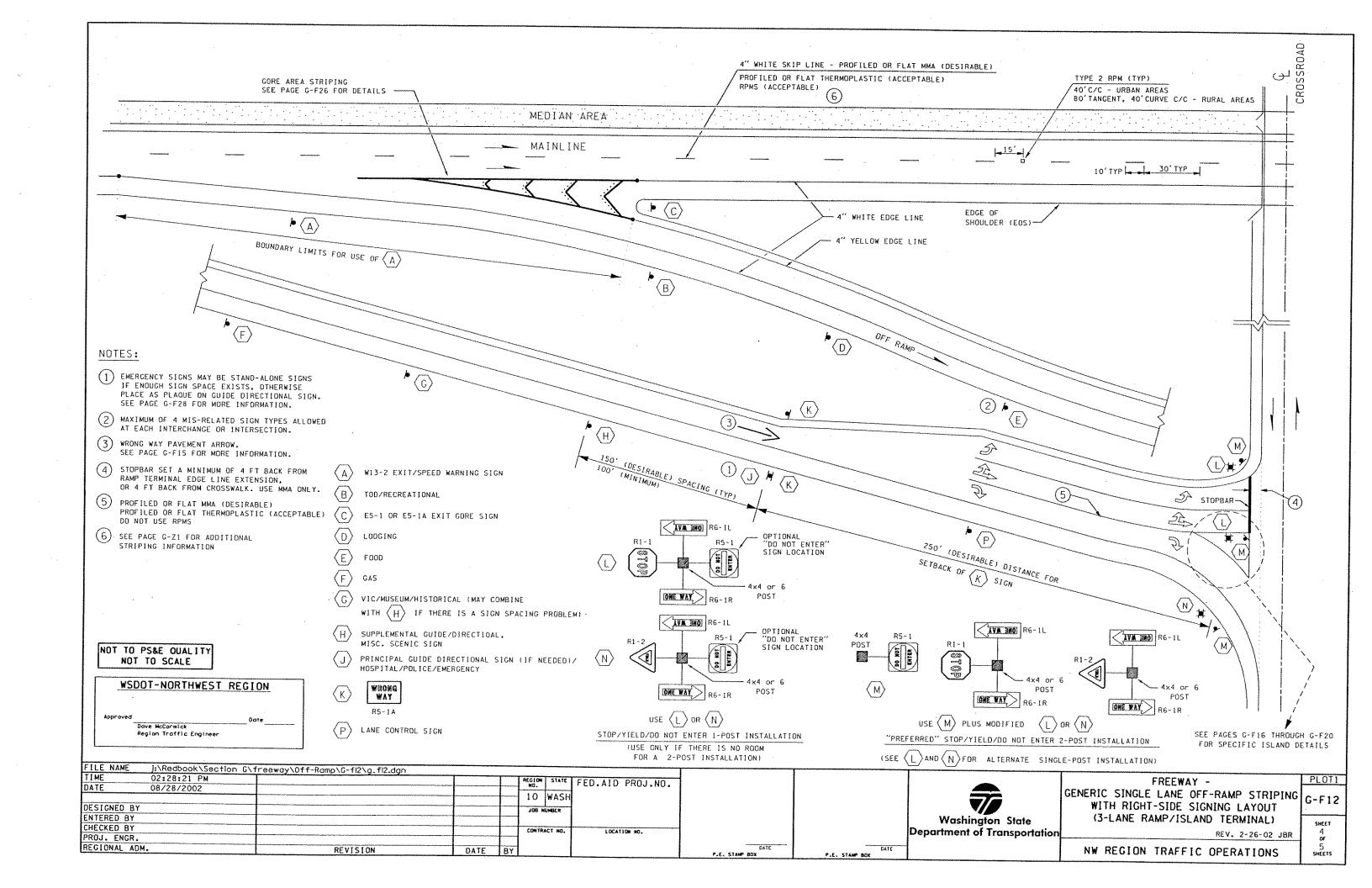


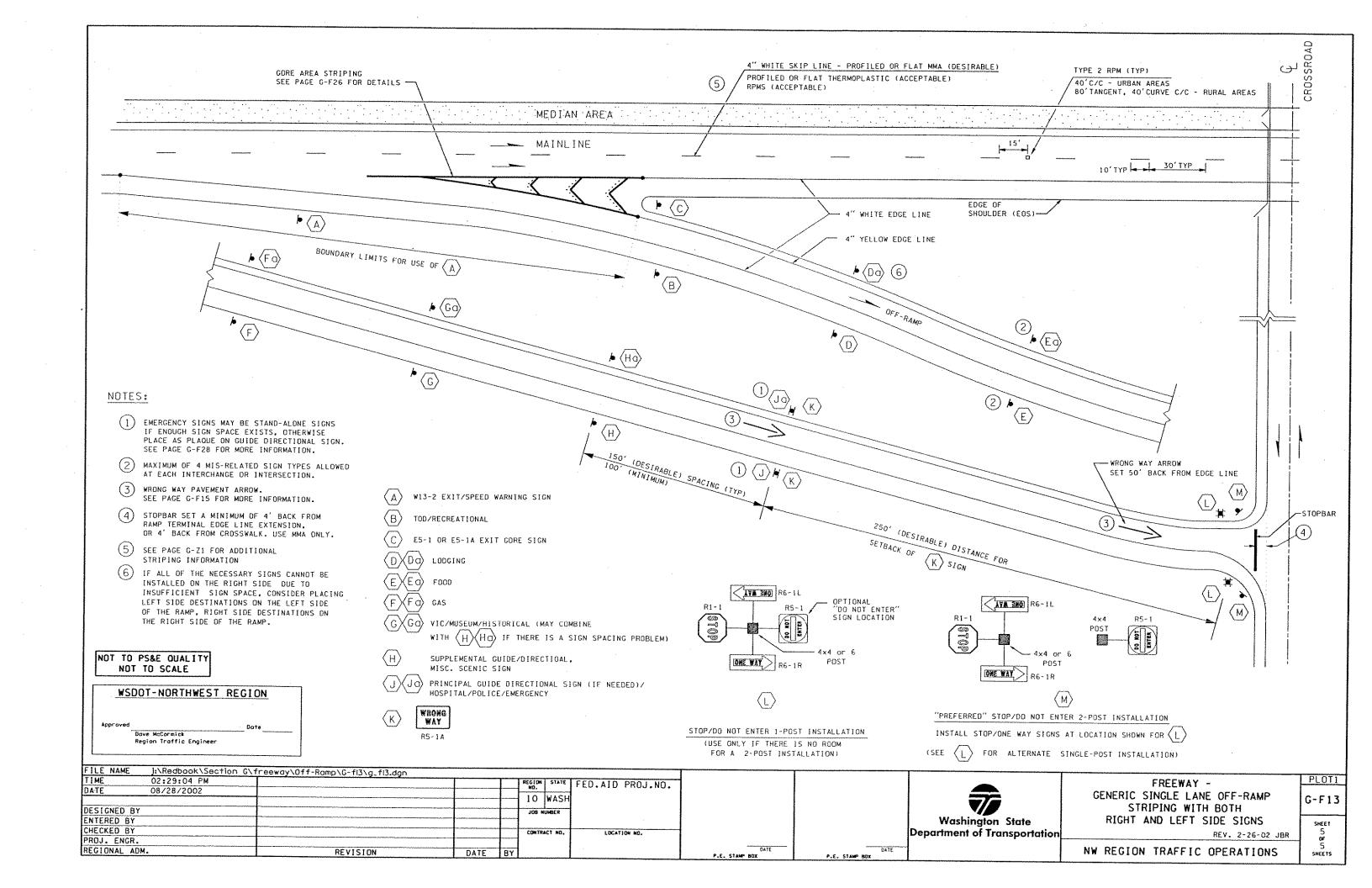


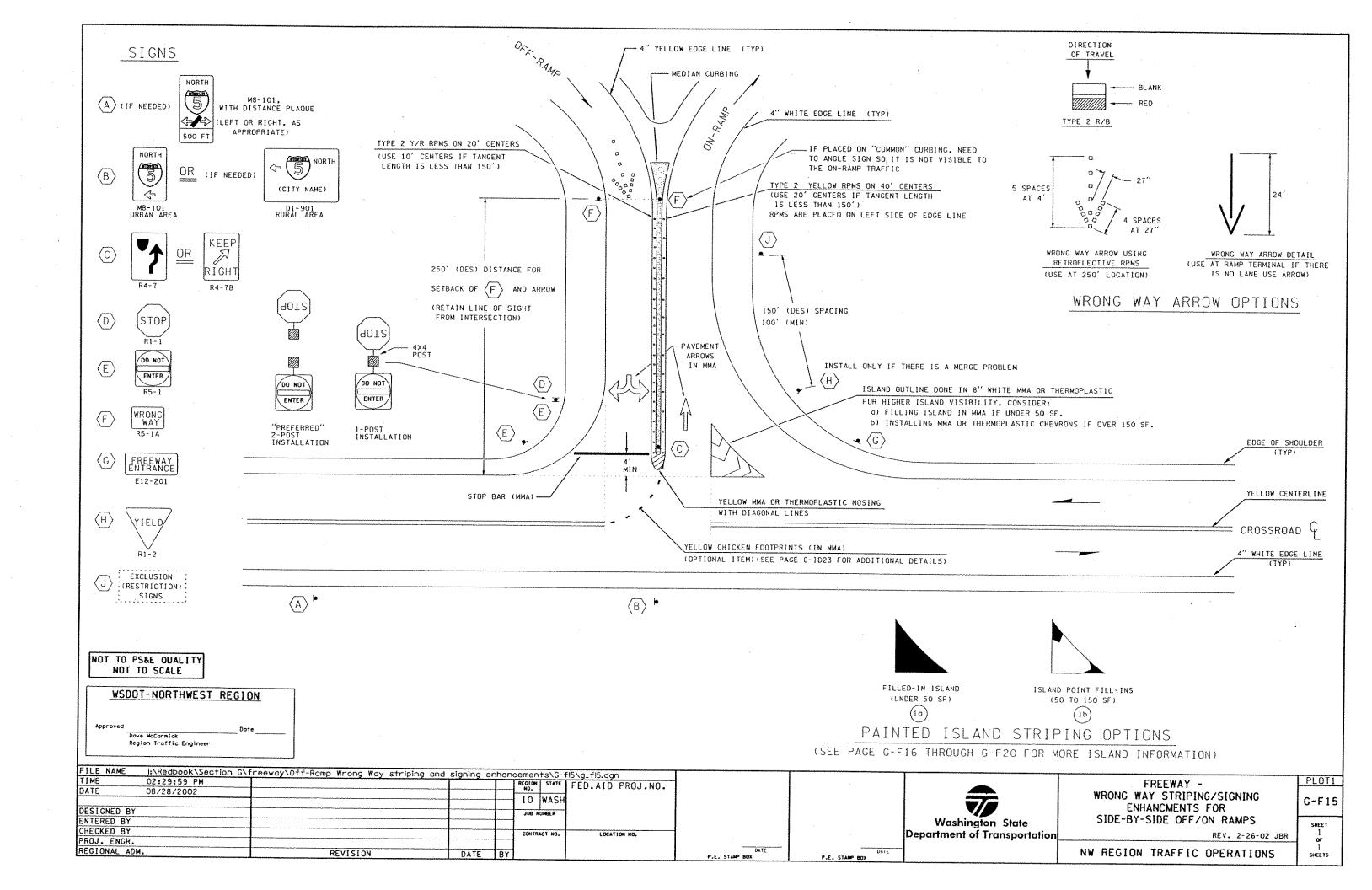


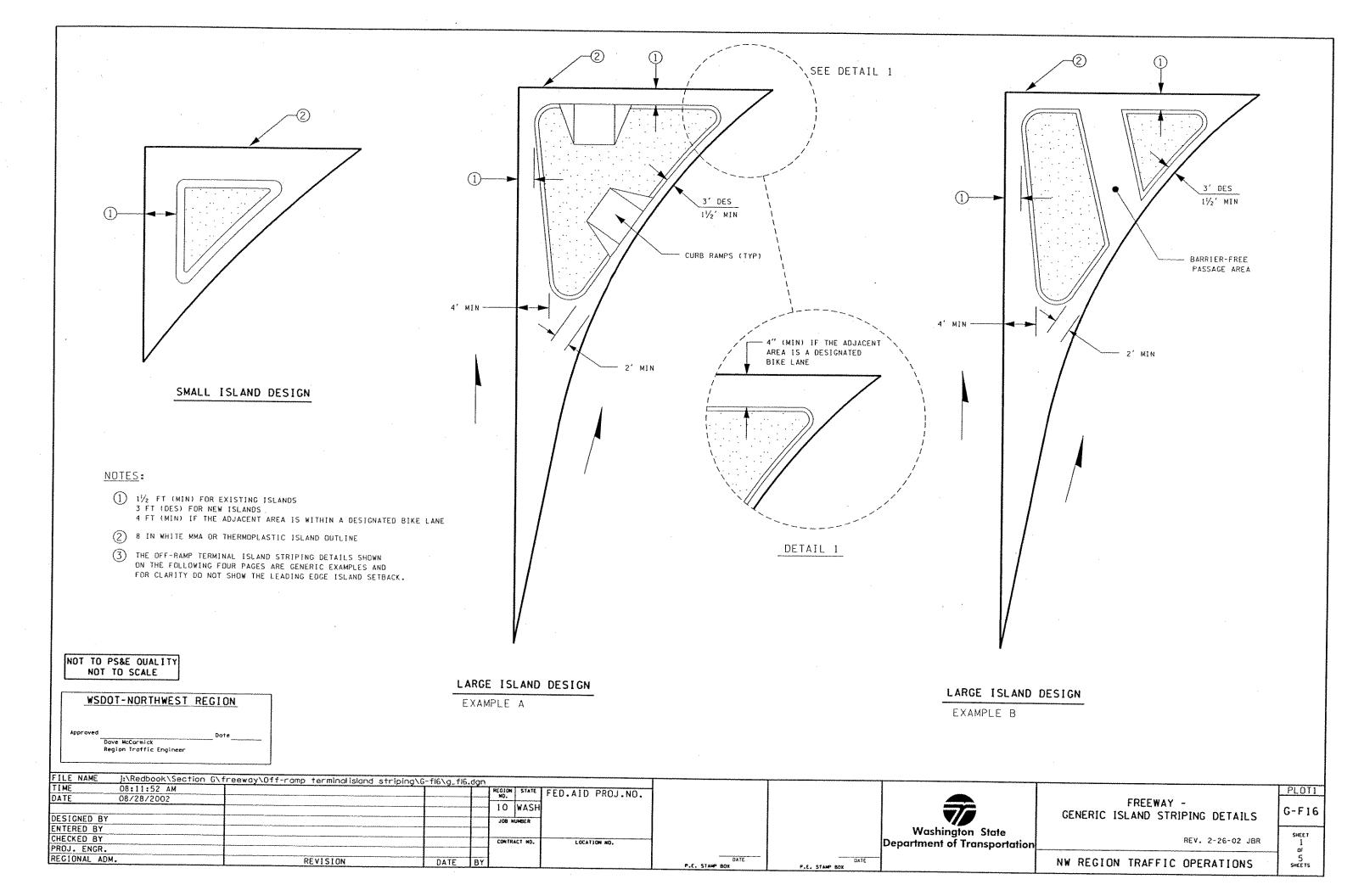


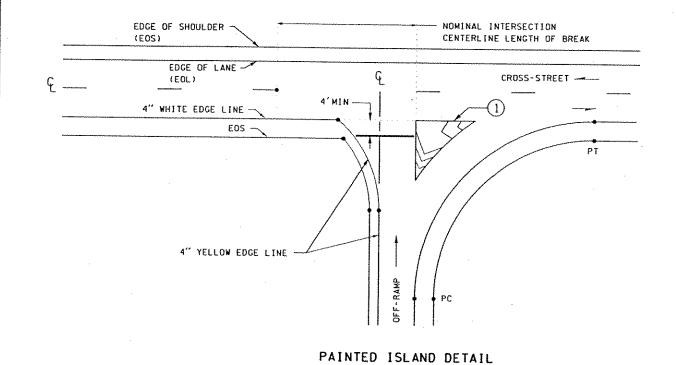










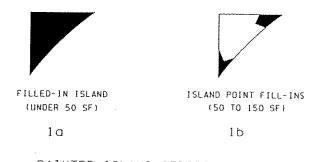


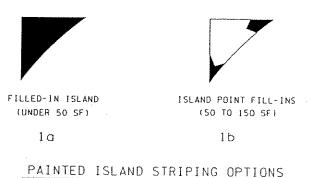
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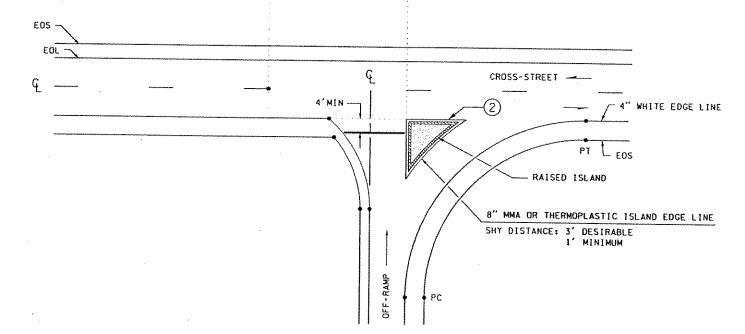
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> Dave McCormick Region Traffic Engineer

WSDOT-NORTHWEST REGION







SIMPLE RAISED ISLAND DETAIL

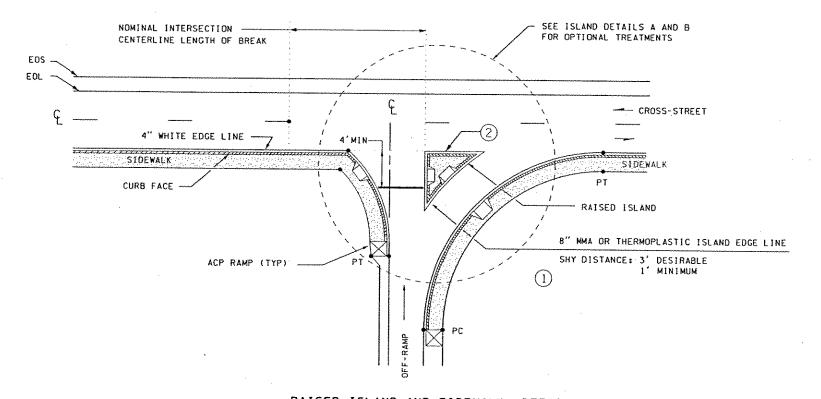
EXAMPLE #2

NOTES:

- ISLAND OUTLINE DONE IN 8 IN MMA OR THERMOPLASTIC. FOR HIGHER VISIBILITY, CONSIDER:

 a) FILLING ISLAND IN MMA IF UNDER 50 SF. DO NOT USE A "FILL-IN" PATTERN IF IT IS IN LINE
 WITH A MARKED CROSSWALK OR IF IT IS IN LINE WITH AN UNMARKED CROSSWALK
 THAT MAY HAVE HIGH PEDESTRIAN USAGE.
 b) FILL-IN ISLAND POINTS USING A "V" PATTERN. MINIMUM LENGTH OF FILL-IN SHOULD BE 5 FT.
 c) INSTALLING THERMOPLASTIC CHEVRONS IF OVER 150 SF.
 45+/- DEG. VEE ANGLE (2 TO 3 EQUALLY SPACED VEES USED AT EACH CORNER)
- IF CROSS STREET HAS A DESIGNATED BIKE LANE, RAISED ISLAND NEEDS TO BE SET BACK AT LEAST THE WIDTH OF THE ADJACENT BIKE LANE.

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RAISED ISLAND AND SIDEWALK DETAIL

EXAMPLE #3

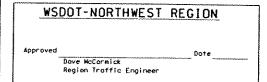
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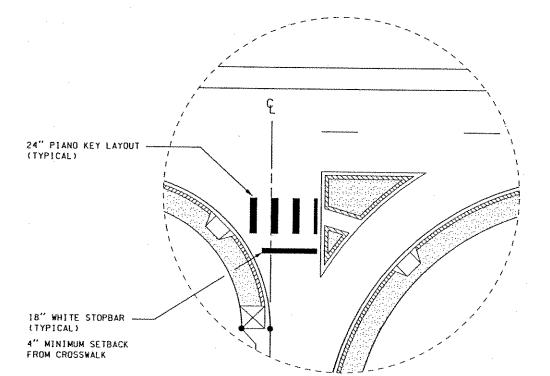
- 1 ISLAND OUTLINE DONE IN MMA OR THERMOPLASTIC.
- 2) IF CROSS STREET HAS A DESIGNATED BIKE LANE, RAISED ISLAND NEEDS TO BE SET BACK AT LEAST THE WIDTH OF THE ADJACENT BIKE LANE.

P.E. STAMP BOX

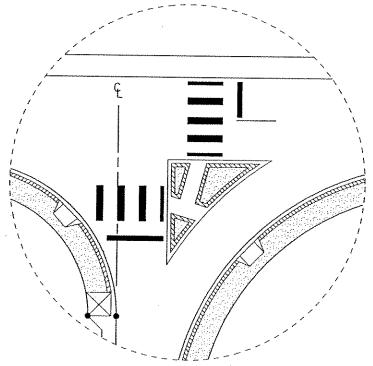
P.E. STAMP BOX

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DETAIL A - ISLAND HANDICAP WALKWAY
WITH ADJACENT RAMP CROSSWALK STRIPING
(CONTROLLED STOP)



DETAIL B - ISLAND HANDICAP WALKWAYS WITH ADJACENT RAMP AND CROSSTREET CROSSWALK STRIPING (CONTROLLED STOP)

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Washington State
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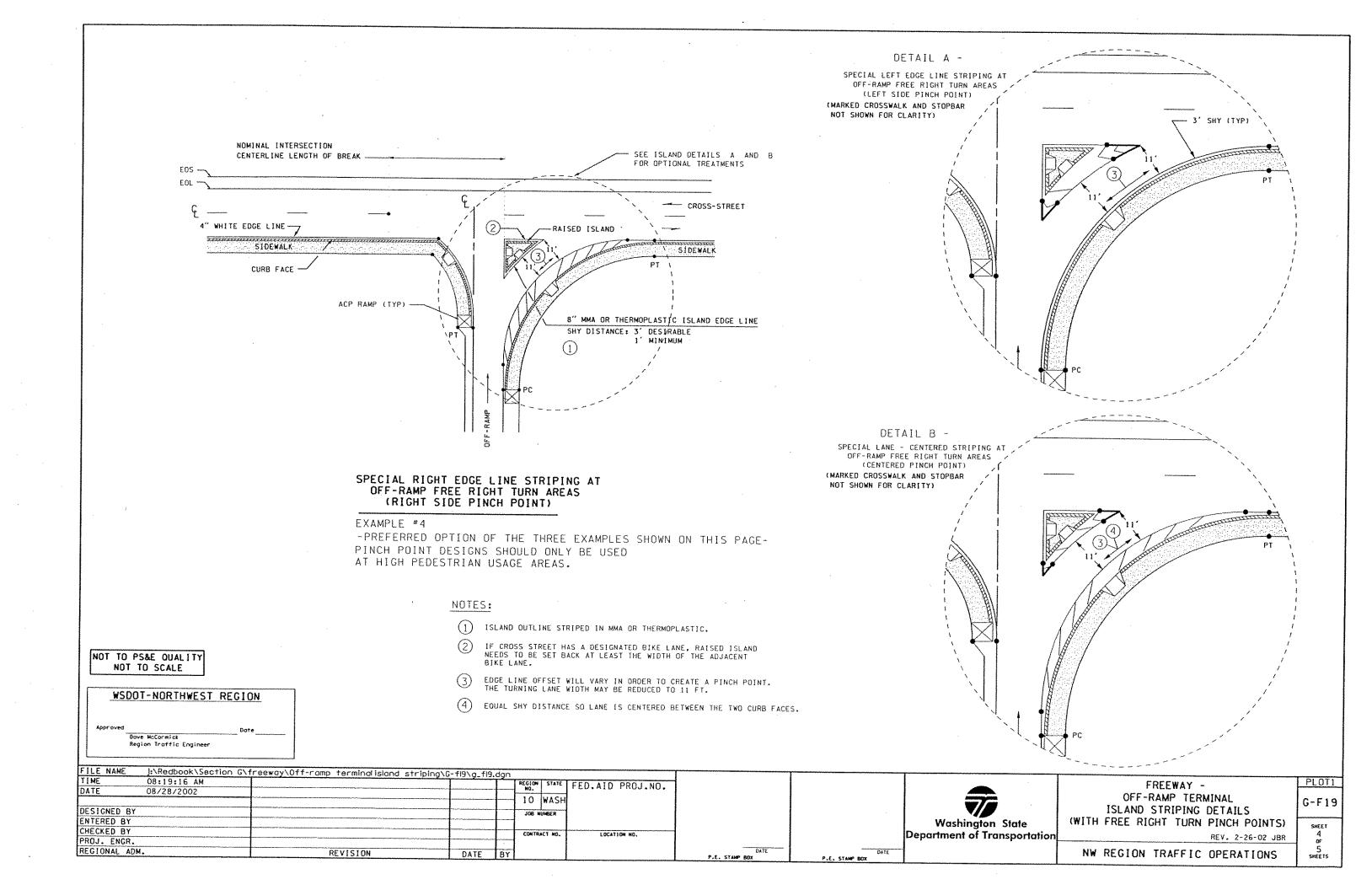
FREEWAY OFF-RAMP TERMINAL
ISLAND STRIPING DETAILS
(WITH CROSSWALK LAYOUT)

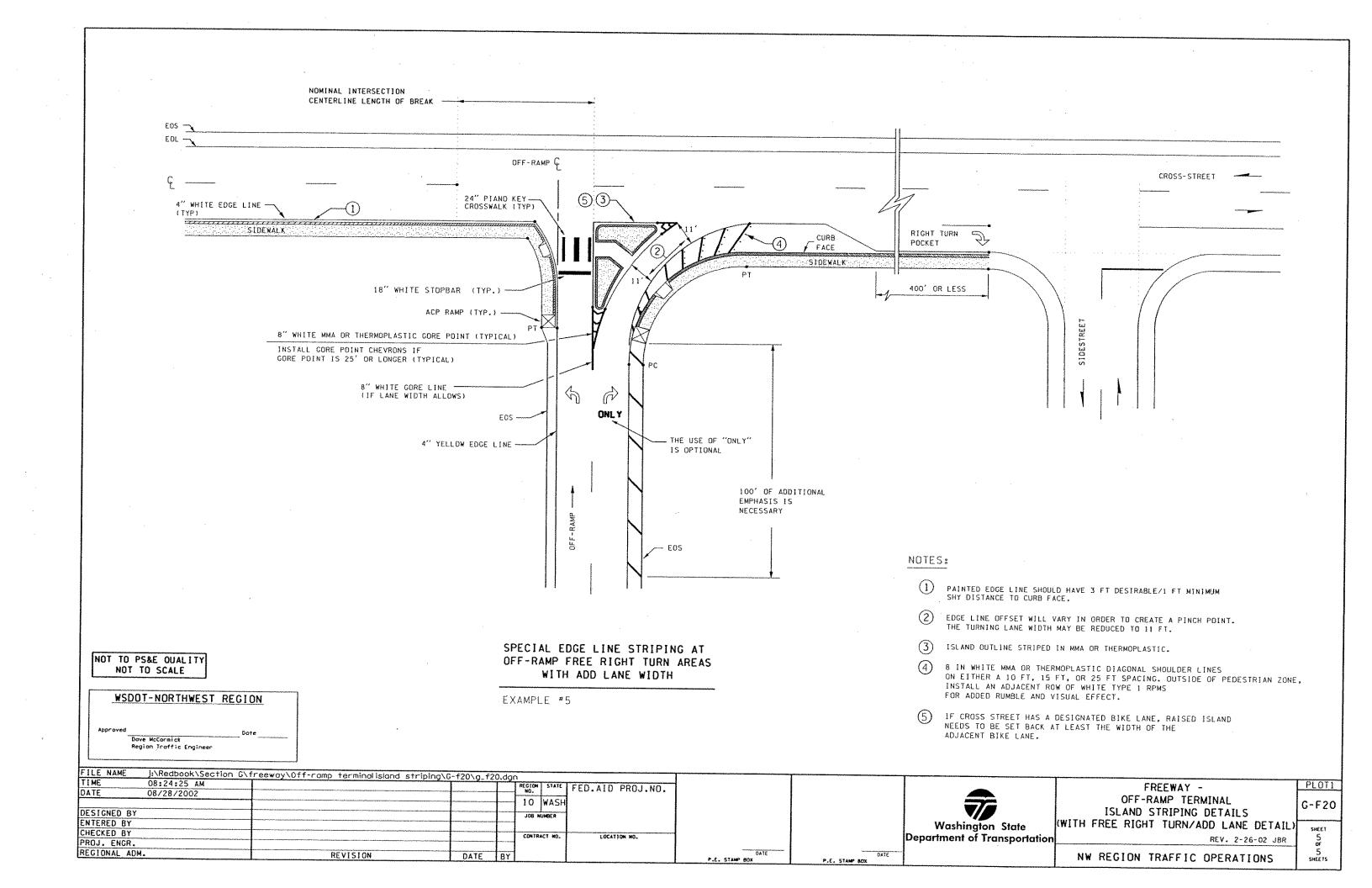
NW REGION TRAFFIC OPERATIONS

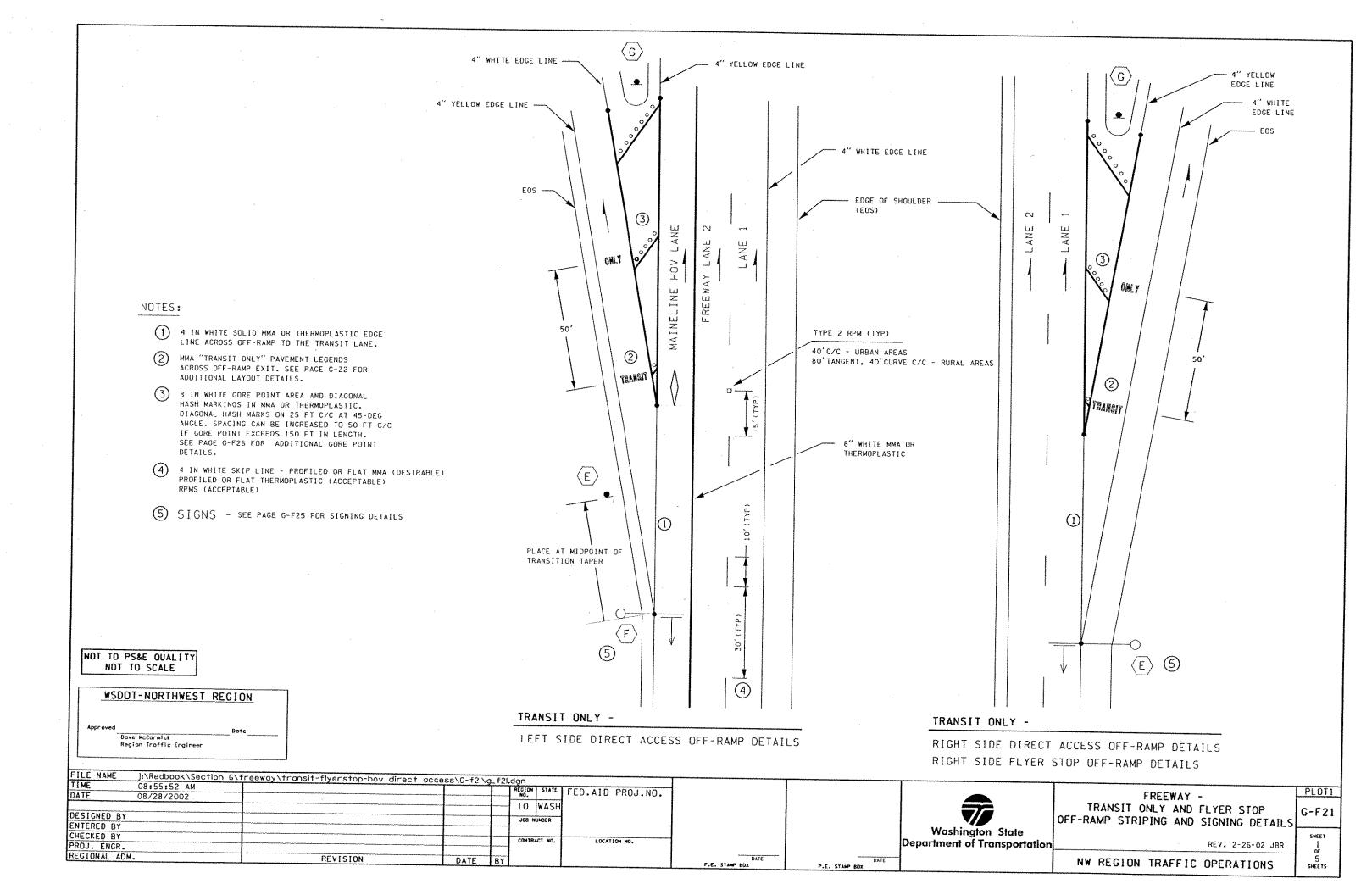
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SHEETS

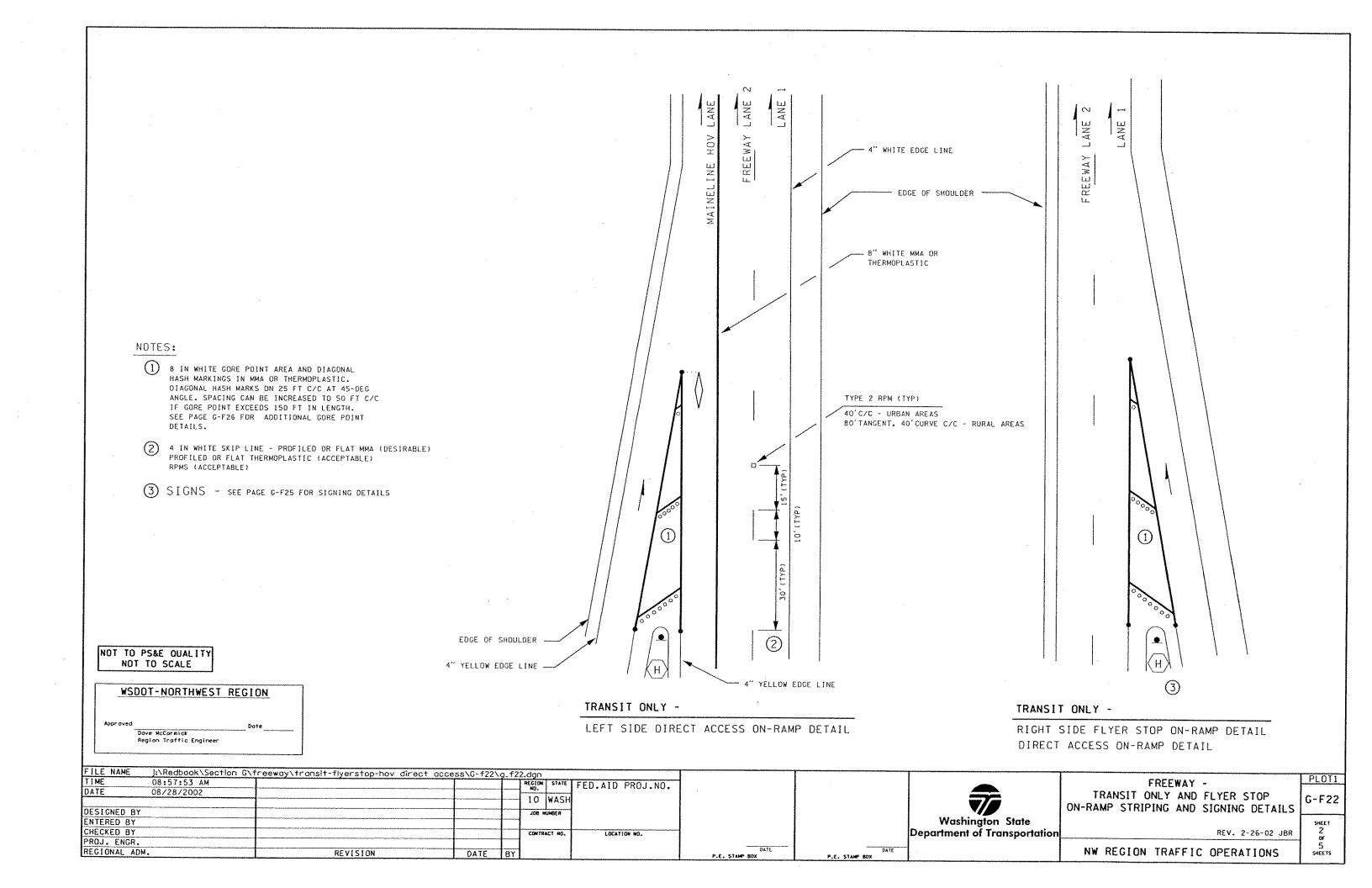
PLOT1

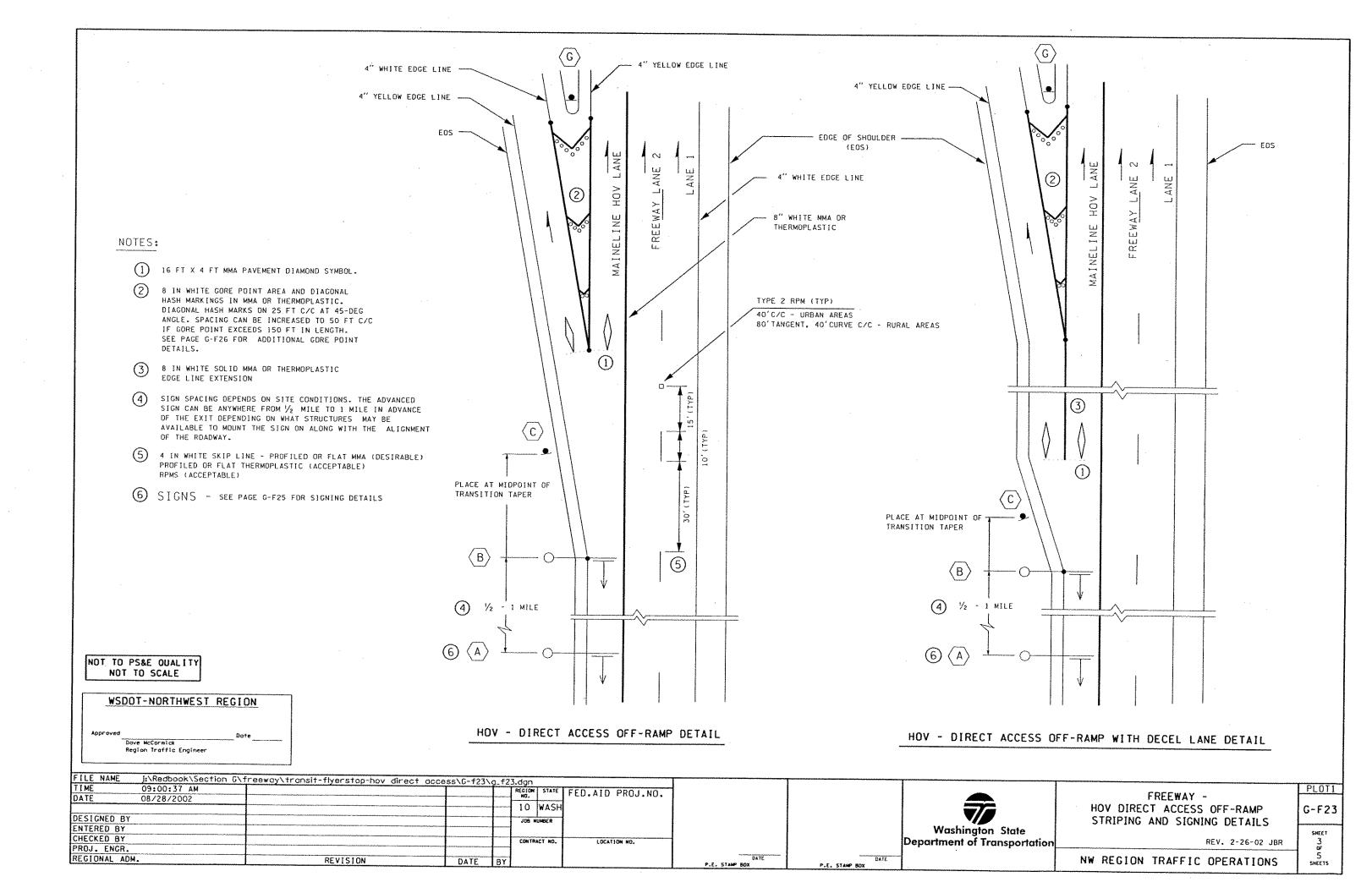
G-F18

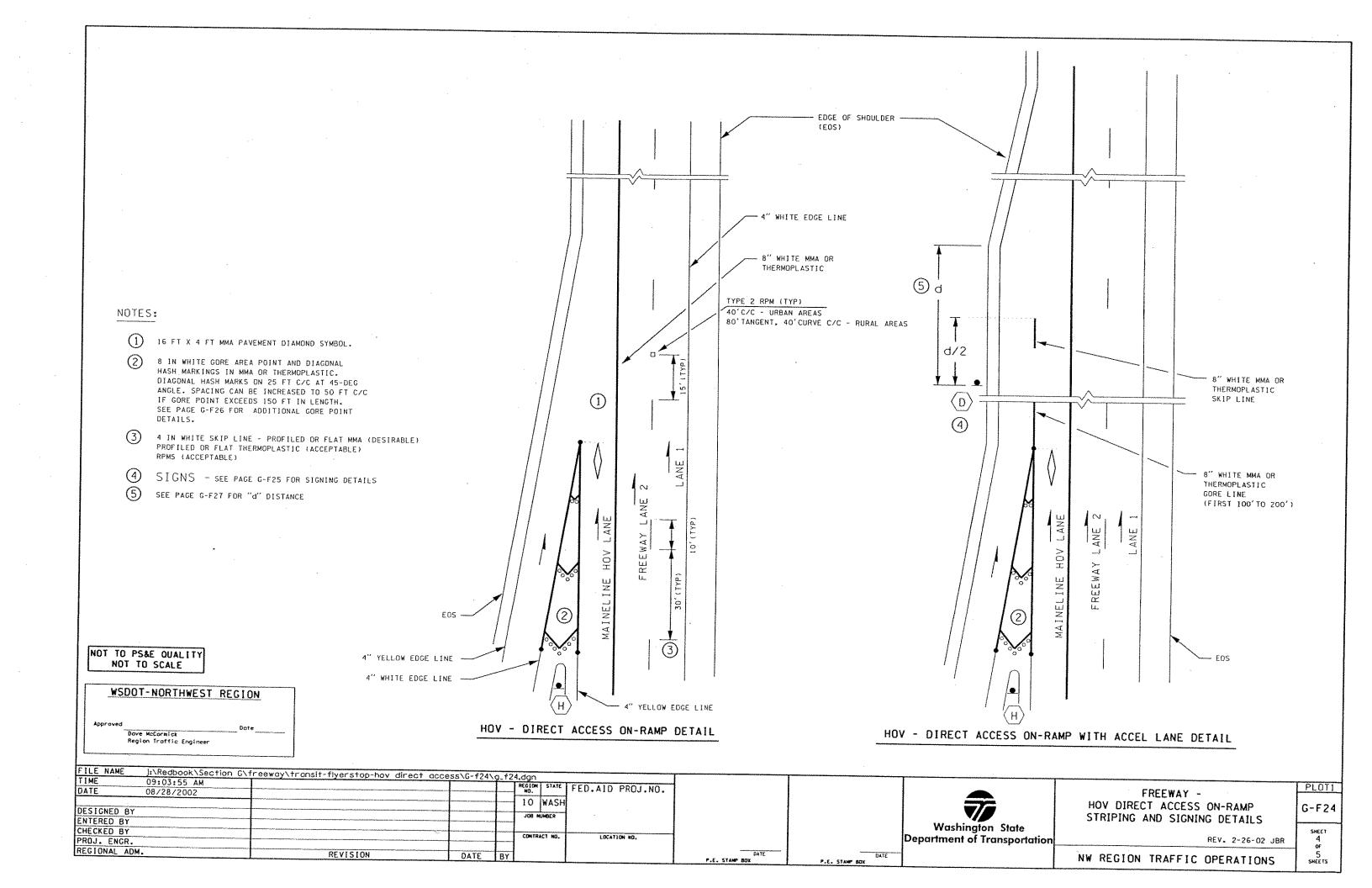


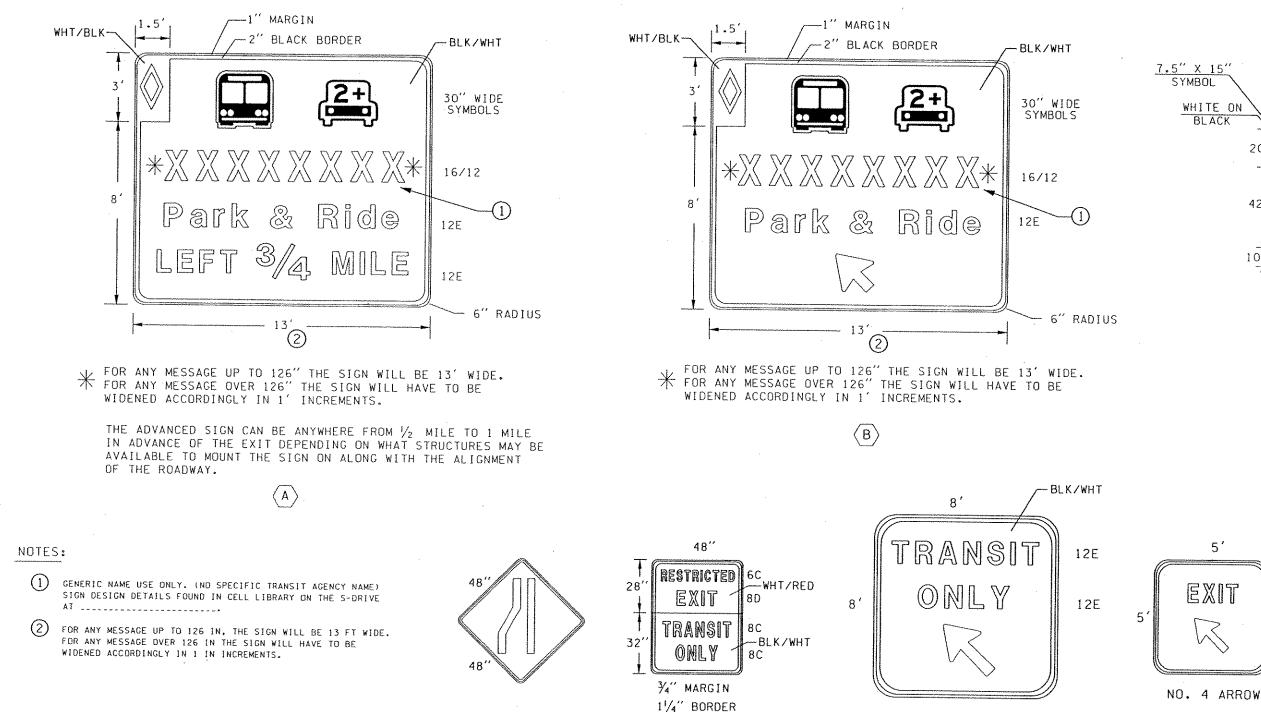












NOT TO PS&E QUALITY NOT TO SCALE

> WSDOT-NORTHWEST REGION Dave McCormick Region Traffic Engineer

 $\langle D \rangle$

 $\langle E \rangle$

NO. 6 ARROW $\langle F \rangle$

EXIT 10E

E5-1 OR E5-1A

W4-1R OR W4-1L

BLACK ON

WHITE

ED BLACK ON

60

-|14"

BUSES AND 2 PERSON

CARPOOLS

R3-11LB MOD

 $\langle c \rangle$

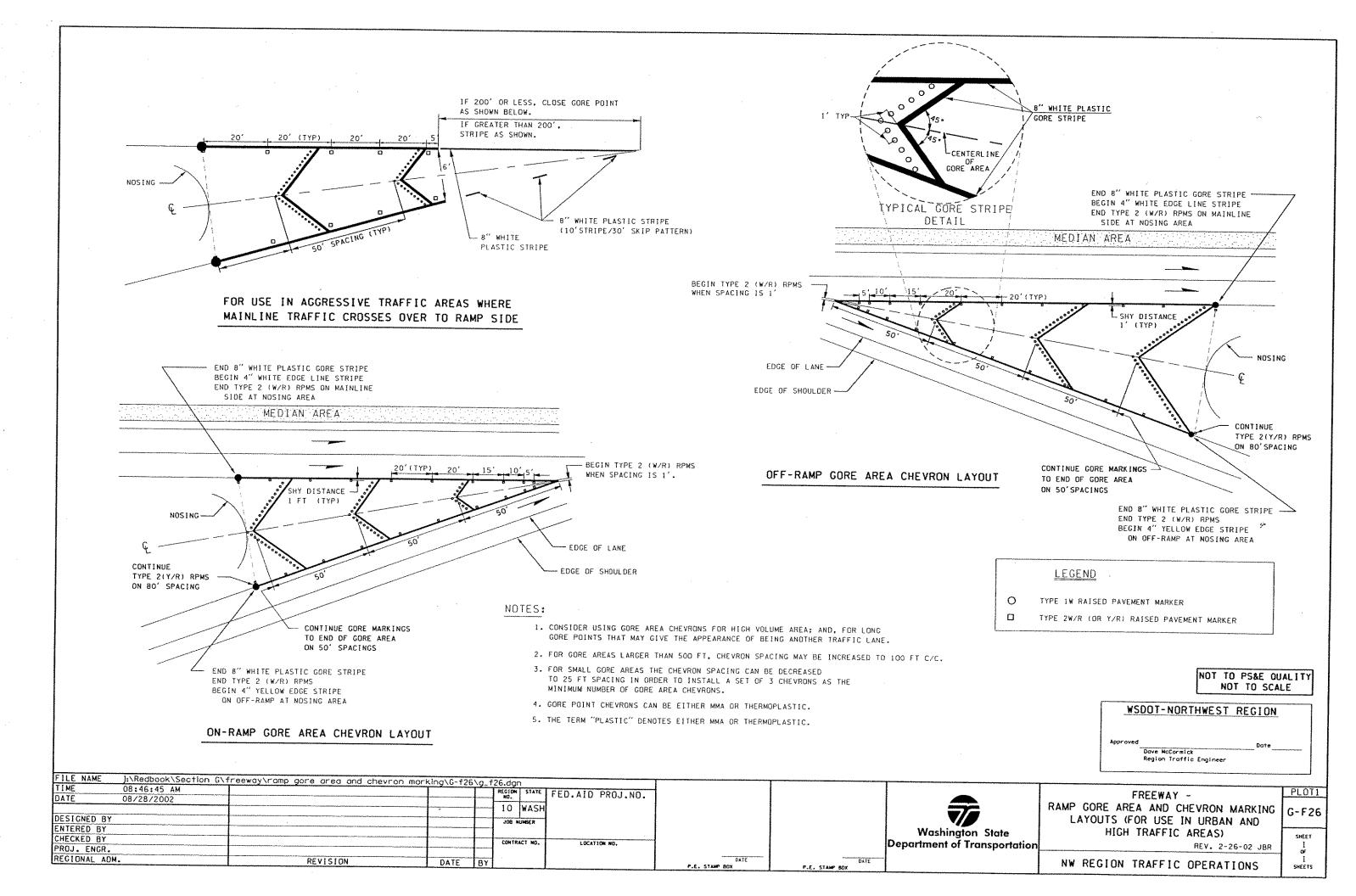
10" WOTORCYCLES OK

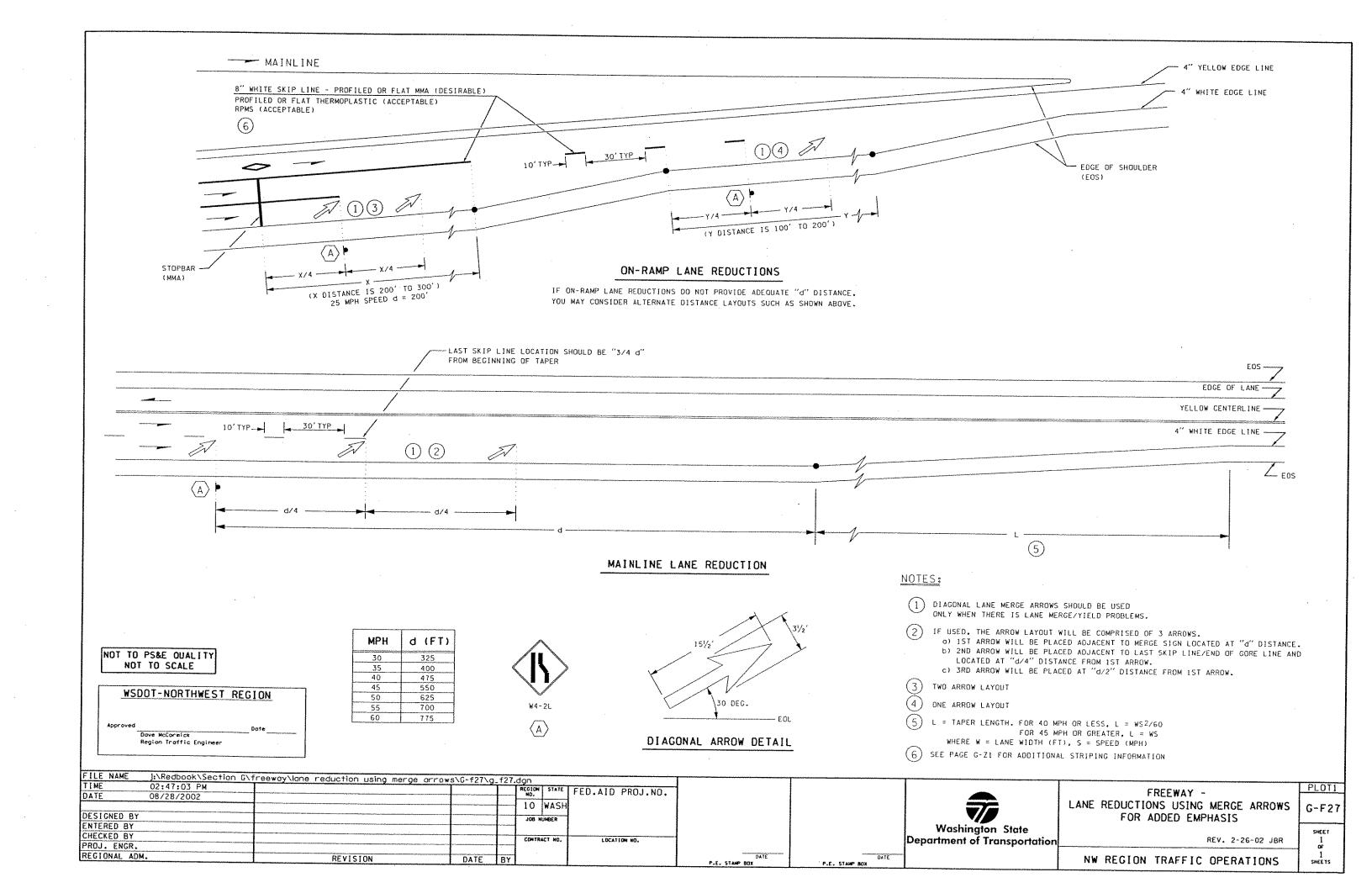
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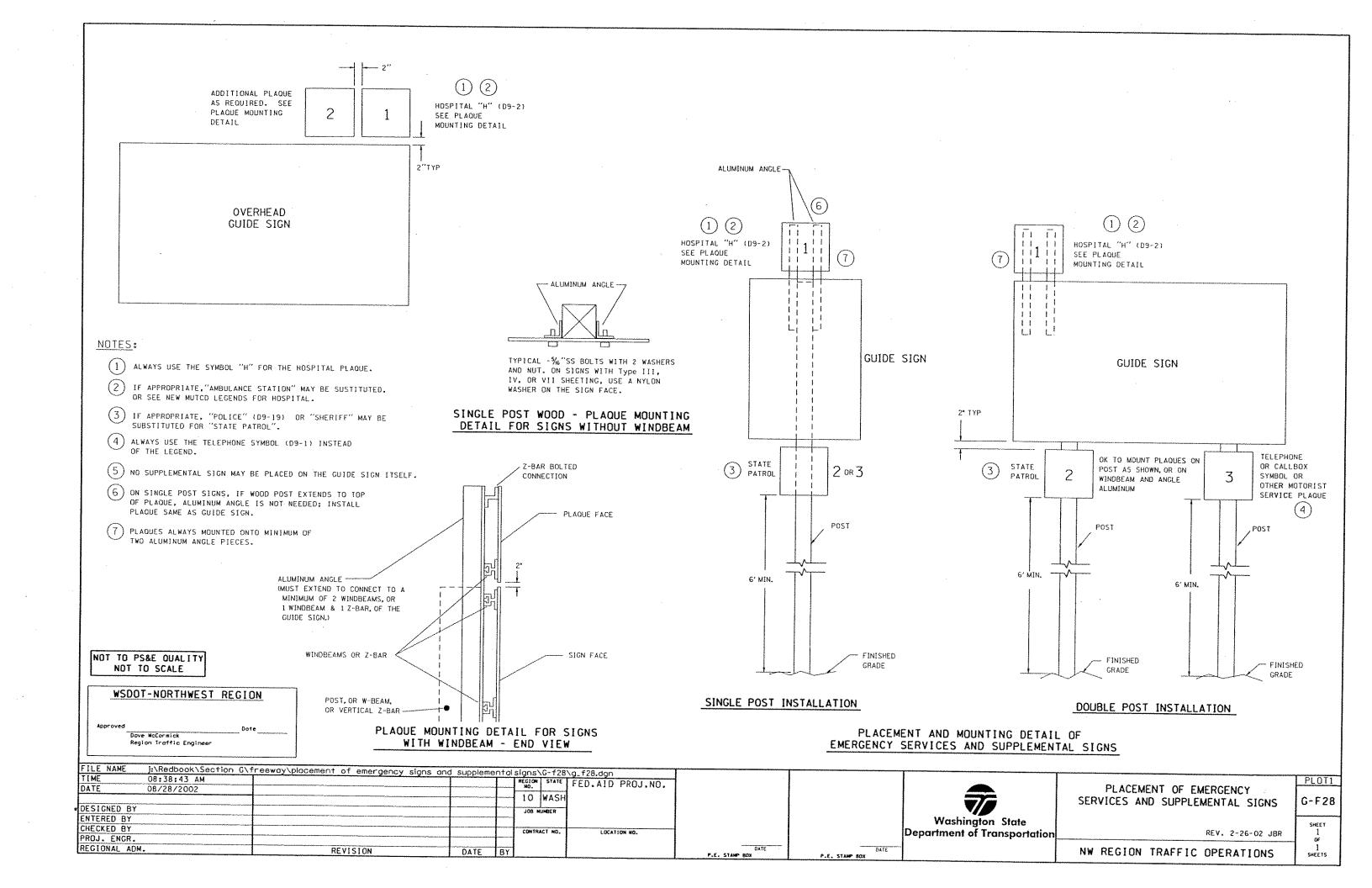
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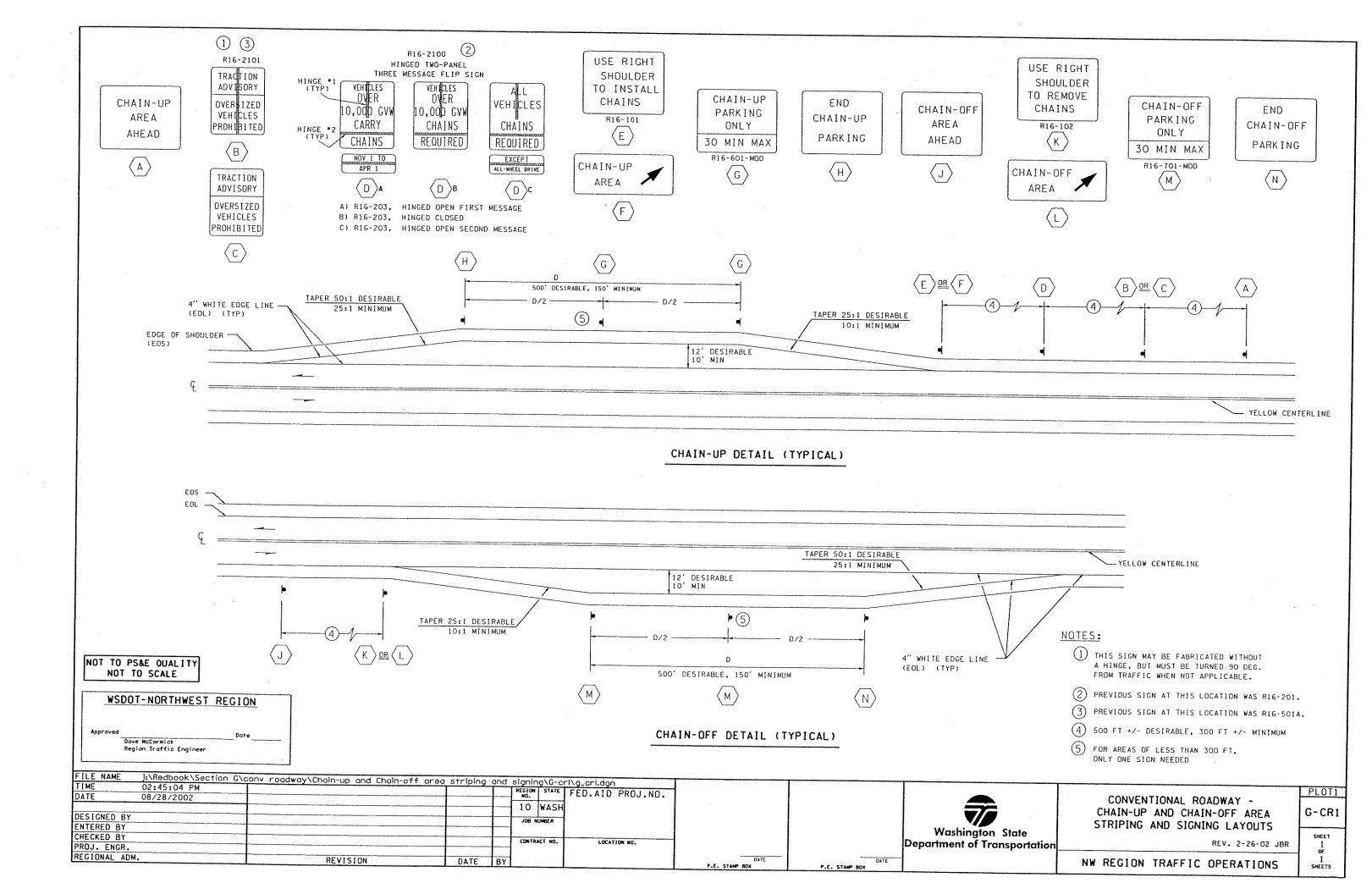
TRANSIT AND HOV - SIGN DESIGN DETAILS

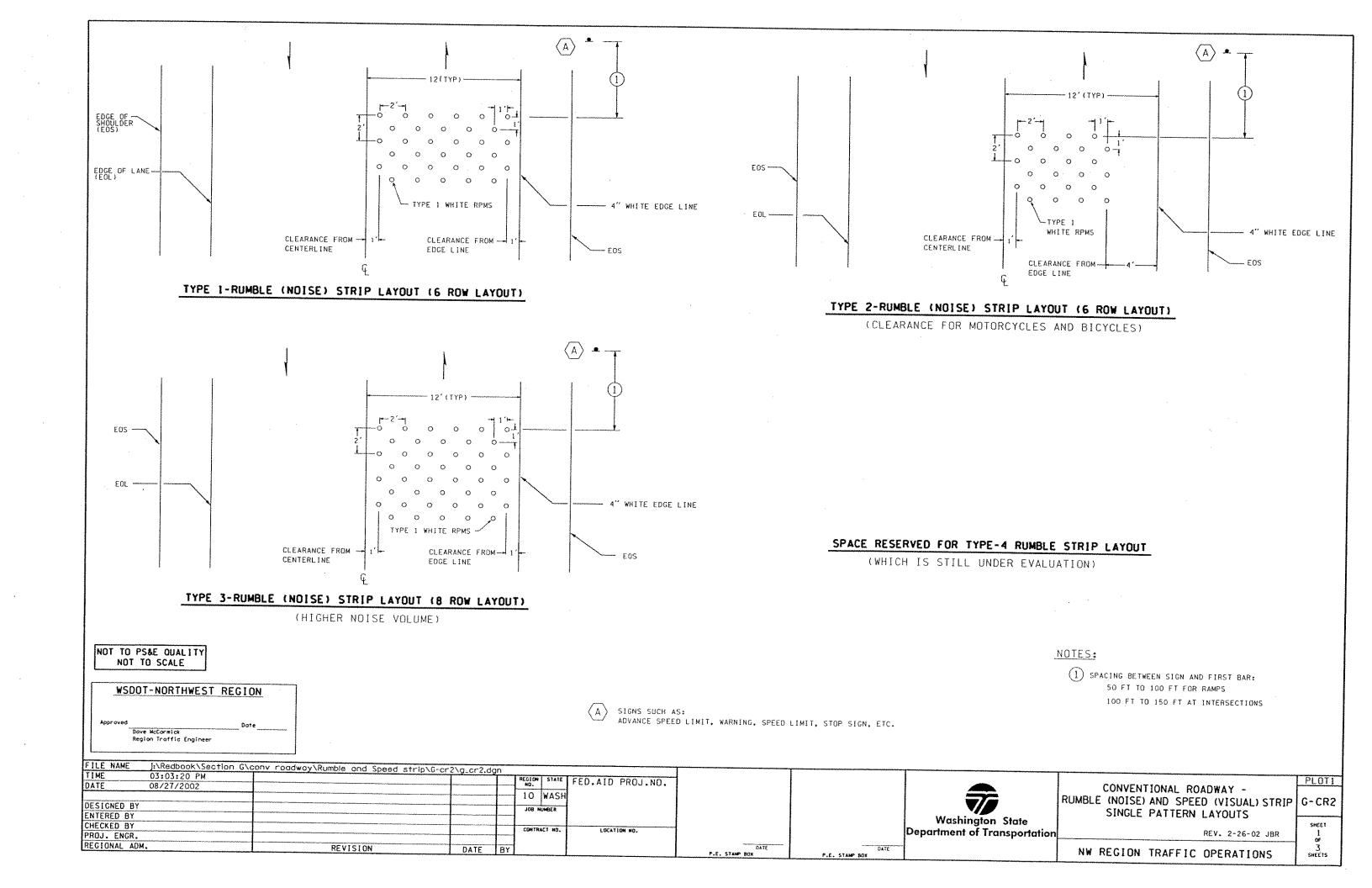
ATE 08/28/2002	reeway\transit-flyerstop-hov direct ac		REGION ST NO. 10 WA	FED.AID PROJ.NO.			-	FREEWAY - TRANSIT AND HOV	G-F2
ESIGNED BY NTERED BY			JOS NUMBE	;R			Washington State	DIRECT ACCESS SIGNING DETAILS	SHEET
HECKED BY ROJ. ENGR.			CONTRACT	NO. LOCATION NO.			Department of Transportation	REV. 2-26-02 JBR	
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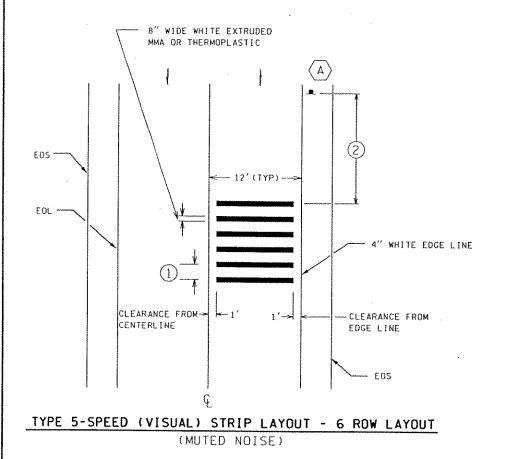






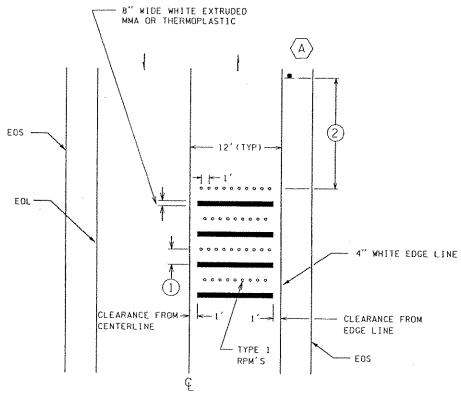






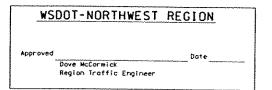
- 8" WIDE WHITE EXTRUDED MMA OR THERMOPLASTIC $\langle A \rangle$ EOS -- 12'(TYP) EOL -- 4" WHITE EDGE LINE CLEARANCE FROM- - 1' ~ CLEARANCE FROM CENTERLINE EDGE LINE

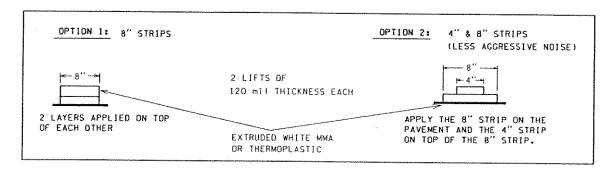
TYPE 6-SPEED (VISUAL) STRIP LAYOUT - 8 ROW LAYOUT (MORE VISIBLE/MORE MUTED NOISE)



TYPE 7-SPEED/RUMBLE (VISUAL/AUDIO) STRIP LAYOUT (MIX OF VISUAL AND NOISE)

NOT TO PS&E QUALITY NOT TO SCALE





ADVANCE SPEED LIMIT, WARNING, SPEED LIMIT, STOP SIGN, ETC.

DATE

P.E. STAMP BOX

DATE

NOTES:

- 1 SPACING BETWEEN TRANSVERSE BARS:
 - 3 FT FOR 30 MPH
 - 4 FT FOR 40 MPH 5 FT FOR 50 MPH 6 FT FOR 60 MPH OR OVER
- 2) SPACING BETWEEN SIGN AND FIRST BAR:

50 FT TO 100 FT FOR RAMPS 100 FT TO 150 FT AT INTERSECTIONS

- 3 SPEED STRIPS APPEAR TO BE SOMEWHAT EFFECTIVE IN REDUCING THE OPERATIONAL SPEED OF THE FIRST TIME USER. HOWEVER, THERE DOES NOT APPEAR TO BE A LONG TERM EFFECT IN REDUCING THE OPERATIONAL SPEED WITH THE SPEED STRIPS. THE USE OF SPEED STRIPS SHOULD BE RESTRICTED TO HIGH ACCIDENT LOCATIONS.
- (4) CONSULT NWR TRAFFIC OPERATIONS FOR LAYOUT OPTIONS IF THE AREA HAS HIGH BICYCLE USAGE.

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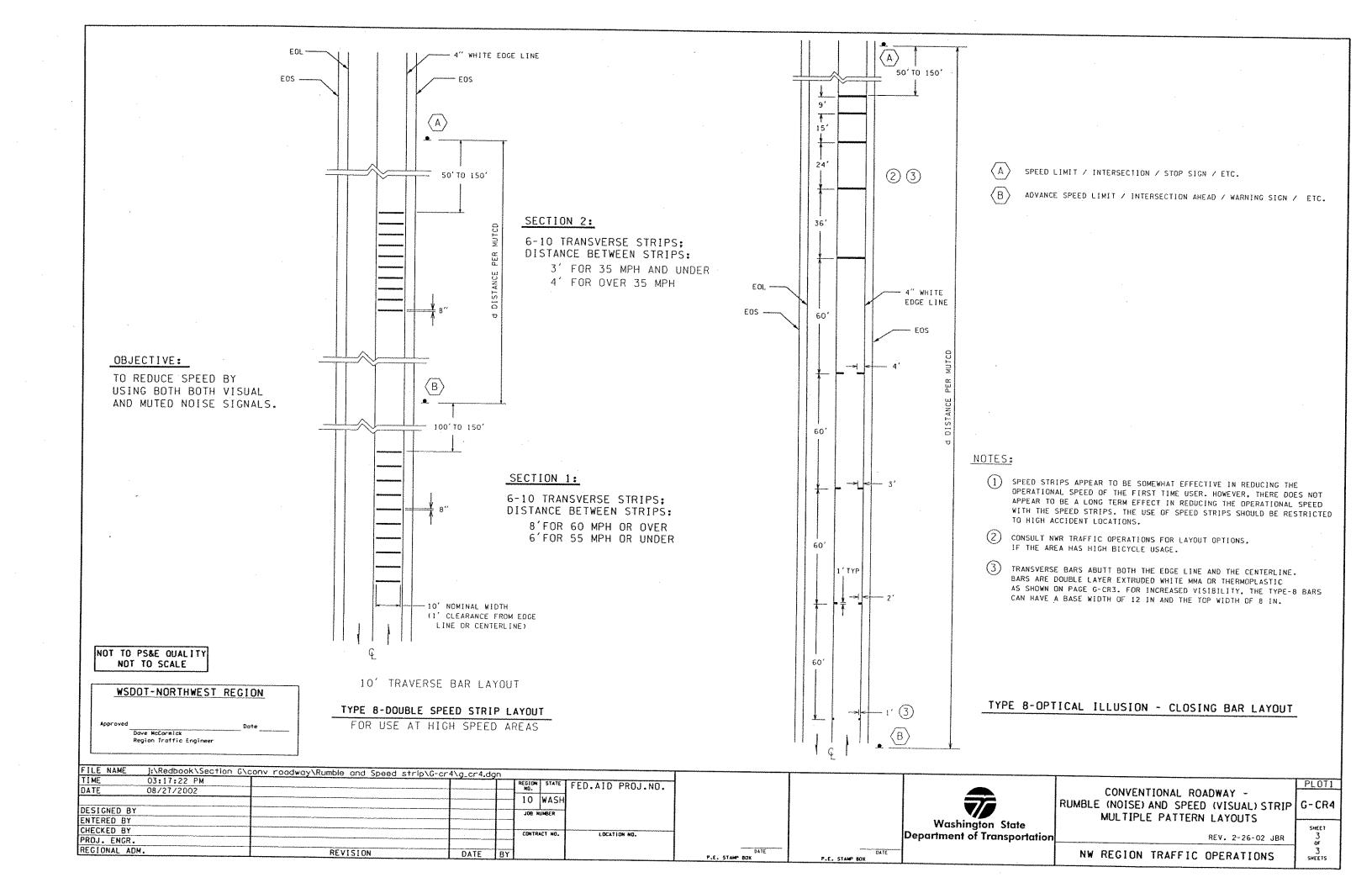
Washington State Department of Transportation

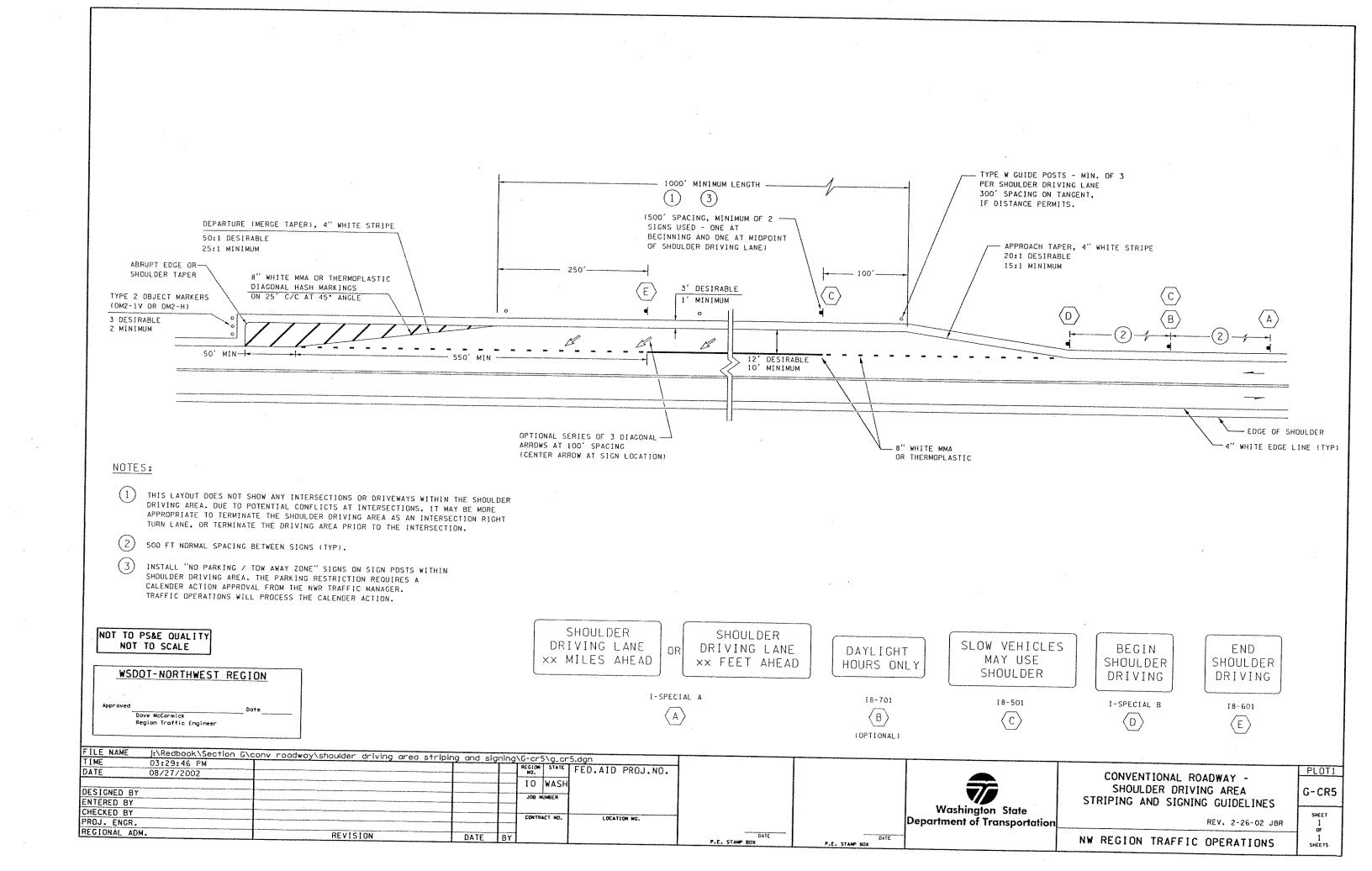
PLOT1 CONVENTIONAL ROADWAY -RUMBLE (NOISE) AND SPEED (VISUAL) STRIP G-CR3 SINGLE PATTERN LAYOUTS

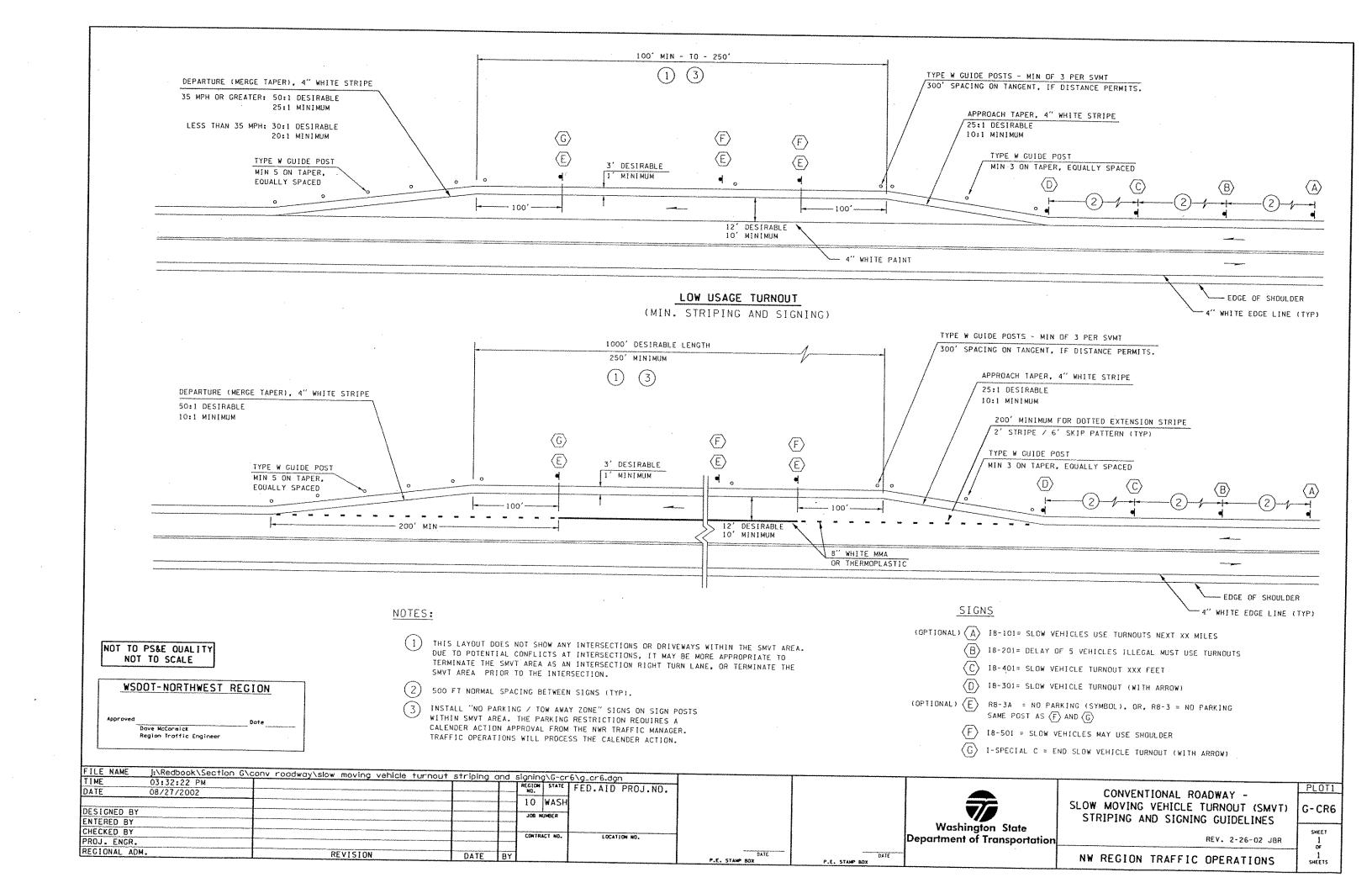
REV. 2-26-02 JBR

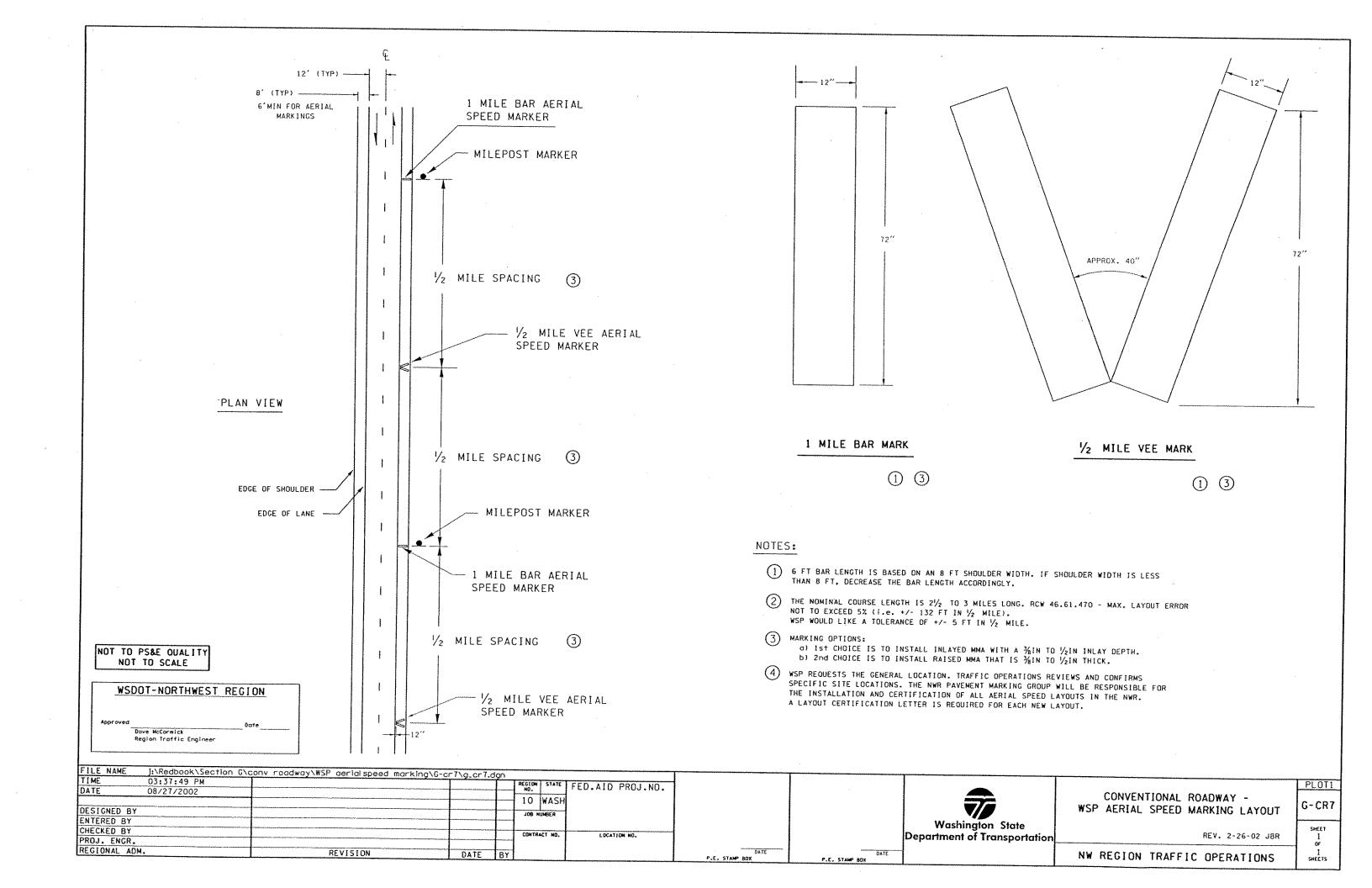
NW REGION TRAFFIC OPERATIONS

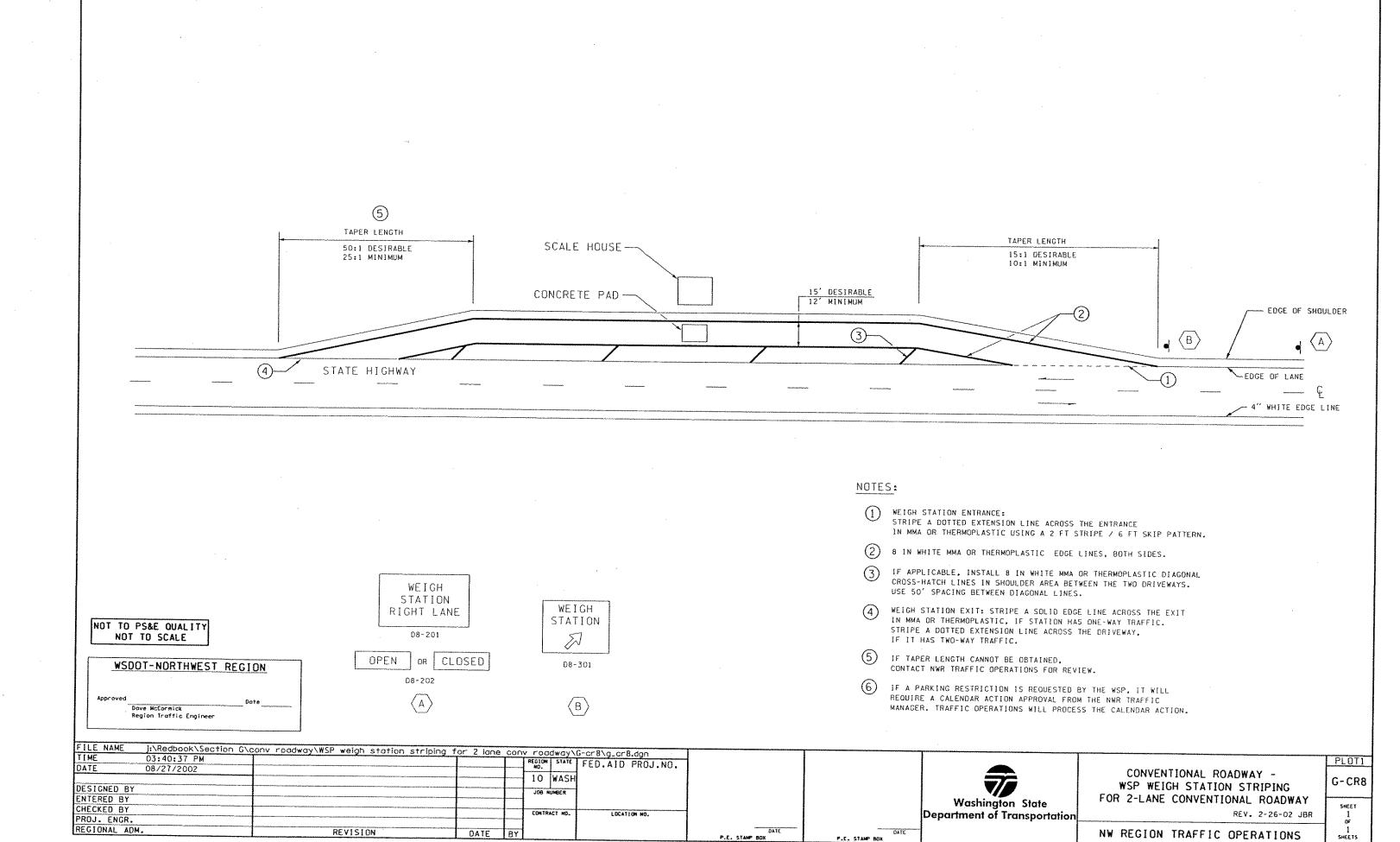
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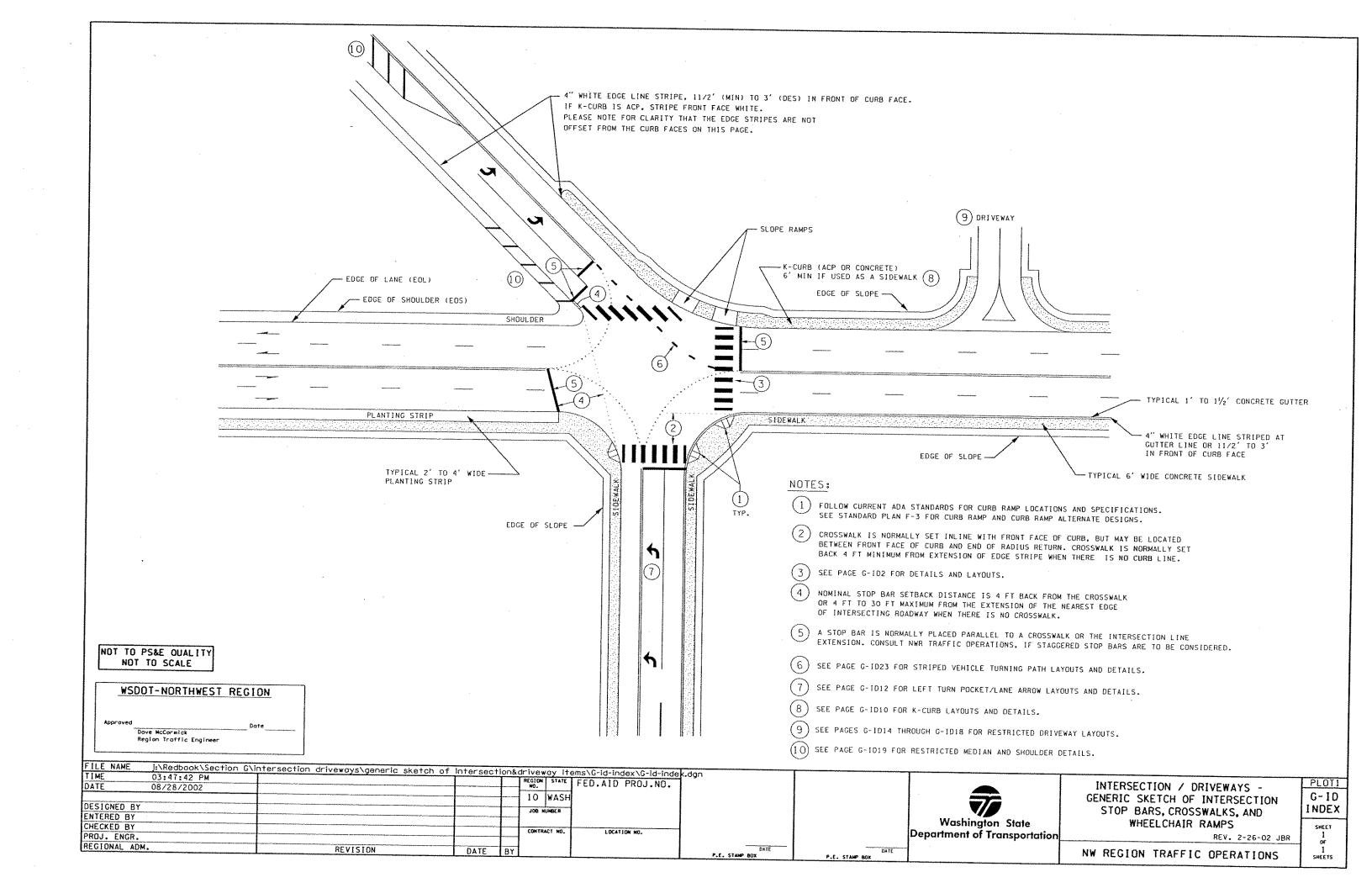


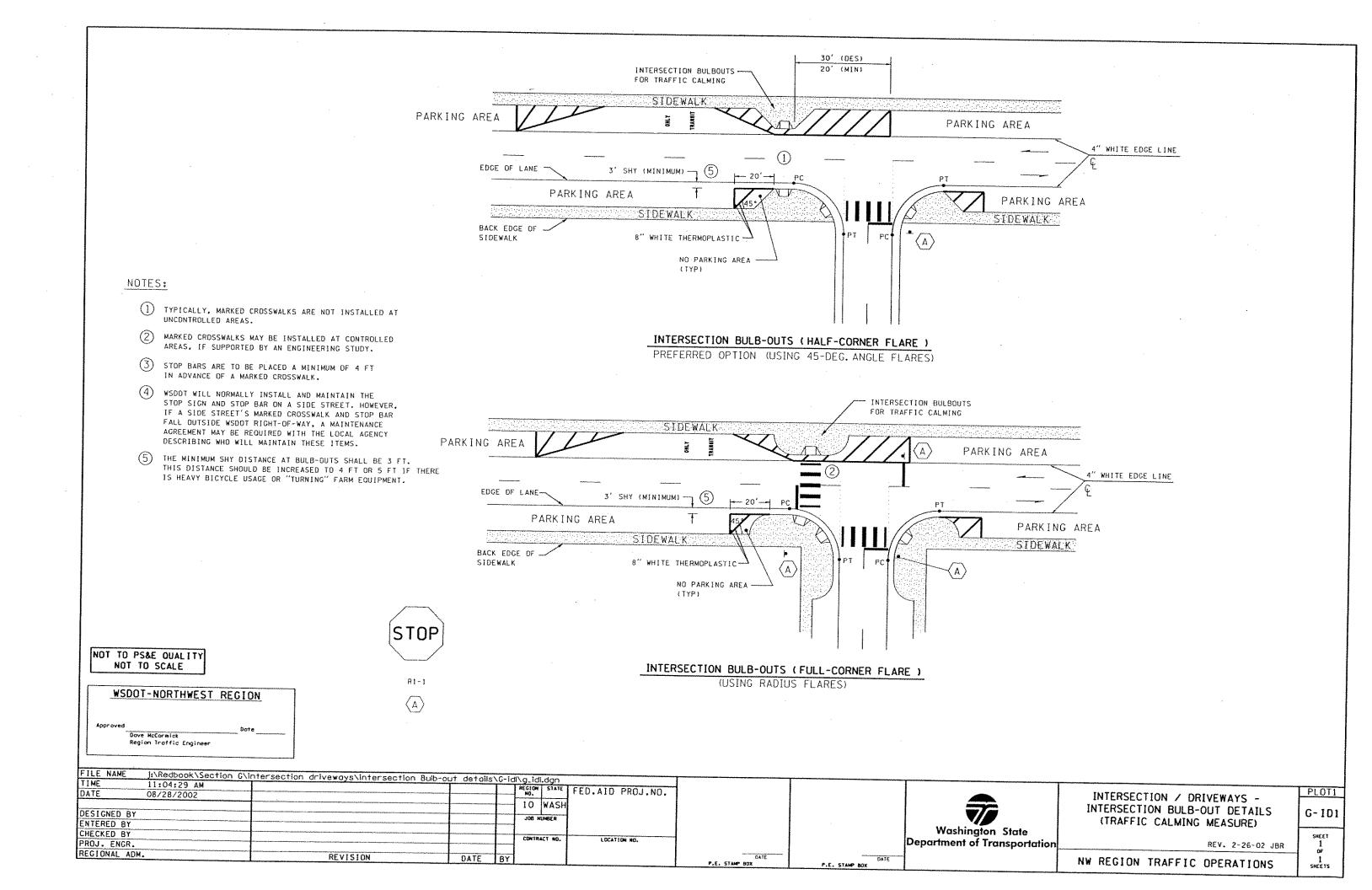


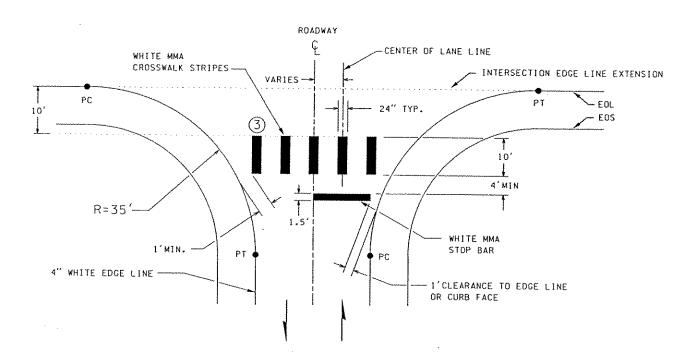




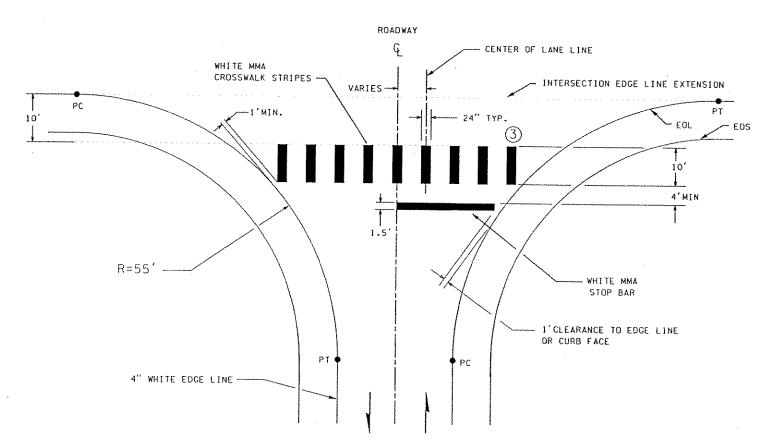








CROSSWALK LAYOUT FOR 35'RADIUS RETURN SET AT 10' FROM INTERSECTION LANE LINE EXTENSION



CROSSWALK LAYOUT FOR 55'RADIUS RETURN SET AT ____10' FROM LANE EXTENSION LINE

PLOT1

G-ID2

SHEET

NOTES:

- THE PREFERRED CROSSWALK SETBACK FROM THE INTERSECTION EDGE LINE EXTENSION IS FROM 10 FT TO 15 FT. THIS SETBACK CAN VARY DUE TO OTHER GEOMETRIC CONSIDERATIONS. SEE PAGE G-1D3 FOR GENERIC SETBACK LOCATIONS.
- WSDOT WILL NORMALLY INSTALL AND MAINTAIN A STOP SIGN AND STOP BAR
 ON A SIDE STREET TO A STATE HIGHWAY. HOWEVER, IF A SIDE STREET'S MARKED
 CROSSWALK AND STOP BAR ARE LOCATED OUTSIDE OF WSDOT'S RIGHT-OF-WAY,
 A MAINTENANCE AGREEMENT MAY BE REQUIRED WITH THE LOCAL AGENCY
 DESCRIBING WHO WILL MAINTAIN THESE ITEMS.
- THE CROSSWALK BAR NEAREST THE RADIUS RETURN EDGE LINE OR SHOULDER CURB FACE SHOULD HAVE A 1 FT CLEARANCE BETWEEN THE BAR AND THE EDGE LINE/CURB FACE. THE NOMINAL 24 IN BAR WIDTH CAN BE REDUCED TO 12 IN IN ORDER TO OBTAIN THIS CLEARANCE.
- THE STOP BAR LOCATION IS INDEPENDANT OF THE CROSSWALK LOCATION.
 THE STOP BAR CANNOT BE PLACED ANY CLOSER THAN 4 FT IN ADVANCE OF THE
 CROSSWALK AND SHOULD NOT BE PLACED ANY FURTHER THAN 30 FT FROM THE
 CROSSWALK. THE STOP BAR LOCATION IS BASED UPON THE DESIGN VEHICLE'S
 TURNING PATH, IF THE STOP BAR IS SET TOO FAR BACK, MOTORISTS MAY OVERRIDE
 THE STOP BAR LOCATION. IN THESE CASES IT MAY BE MORE APPROPRIATE TO USE
 A SMALLER DESIGN VEHICLE IN ORDER TO DECREASE THE TURNING PATH DISTANCE.

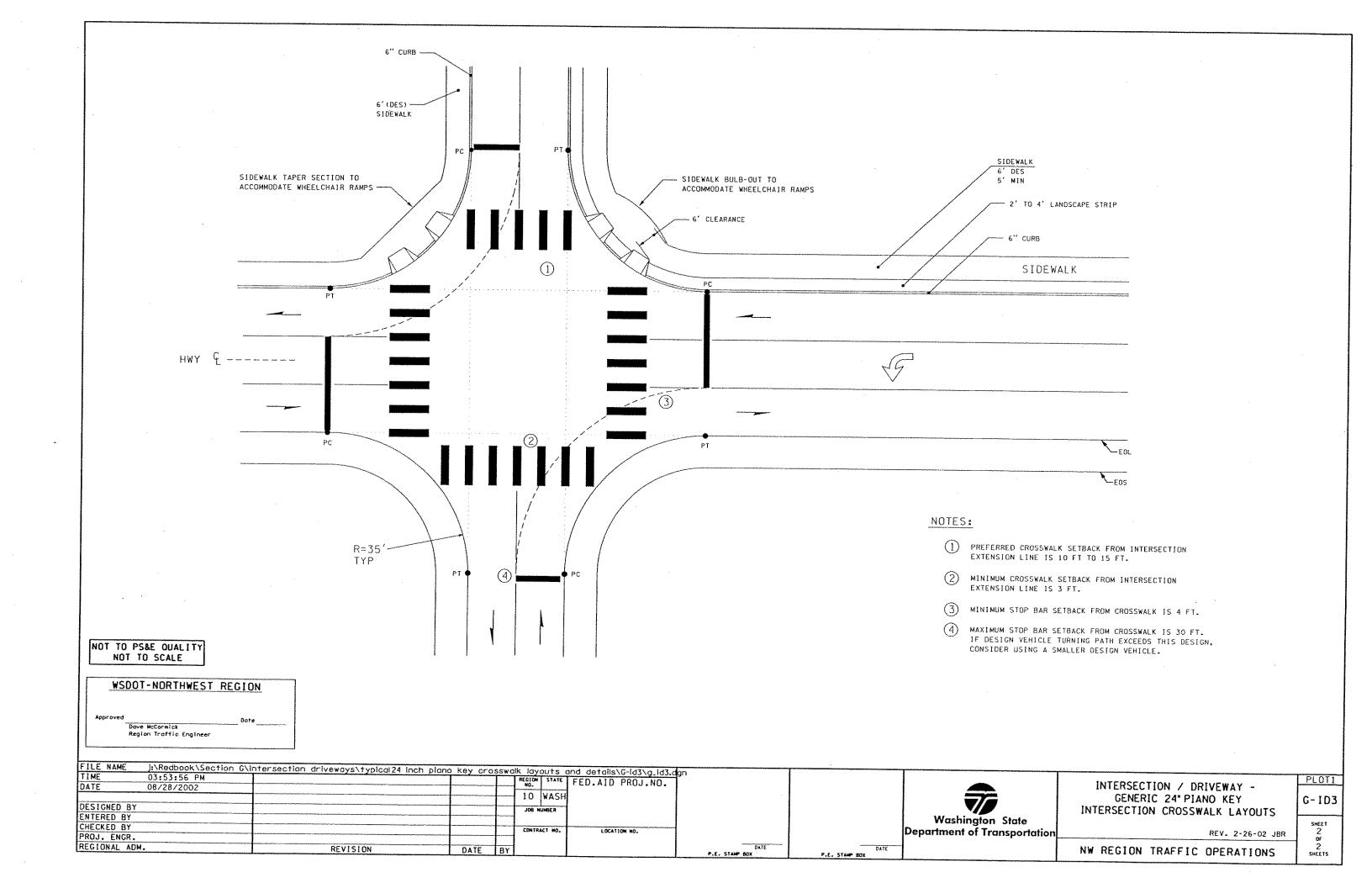
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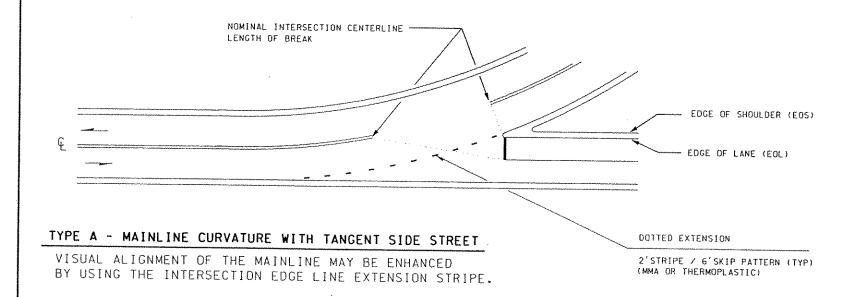
WSDOT-NORTHWEST REGION

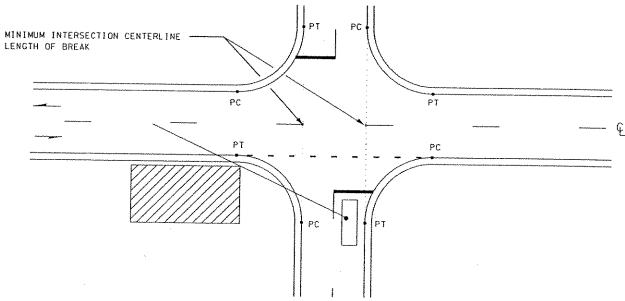
Approved

Dove McCormick
Region Traffic Engineer

j:\Redbook\Section G\intersection driveways\typical24 inch piano key crosswalk layouts and details\G-ld2\g_id2.dgr FILE NAME TIME 03:54:32 PM REGION STATE FED. AID PROJ. NO. INTERSECTION / DRIVEWAY -DATE 08/28/2002 TYPICAL 24" PIANO KEY 10 WASH DESIGNED BY CROSSWALK LAYOUTS JOB NUMBER ENTERED BY (35' AND 55' RADIUS RETURN EXAMPLES) Washington State CHECKED BY CONTRACT NO. LOCATION NO. Department of Transportation REV. 2-26-02 JBR PROJ. ENGR. REGIONAL ADM. DATE REVISION DATE DATE NW REGION TRAFFIC OPERATIONS P.E. STAMP BOX P.E. STAMP BOX







TYPE B - LIMITED SIGHT TRIANGLE

WHEN AN OBSTRUCTION SUCH AS FENCE, WALL, BUILDING, OR CUT SLOPE LIMITS THE SIGHT OF A DRIVER ON A STOP-CONTROLLED SIDE STREET. THE DOTTED EXTENSION STRIPE WILL SERVE AS A REFERENCE TO HELP THE DRIVER DETERMINE HOW FAR THEY CAN ADVANCE INTO THE INTERSECTION.

INTERSECTION EDGE LINE EXTENSION STRIPE

A WHITE 4" WIDE DOTTED EXTENSION LINE INTENDED FOR USE AT INTERSECTIONS TO HELP GUIDE DRIVERS THROUGH THE INTERSECTION. THE NORTHWEST REGION WILL USE A 2' STRIPE / 6' GAP PATTERN FOR ITS INTERSECTION EXTENSION STRIPE.

DATE

. STAMP BOX

NOTES:

- THE EDGELINE EXTENSION STRIPE IS NOT MEANT FOR WIDESPREAD USE. SPECIFIC SITE SELECTION AND APPLICATION WILL BE DETERMINED BY NWR TRAFFIC OPERATIONS BASED ON AN ENGINEERING STUDY. TRAFFIC OPERATIONS WILL MAINTAIN A LIST OF INTERSECTIONS APPROVED FOR EDGELINE EXTENSION STRIPING.
- THE EXTENSION STRIPE SHOULD BE DONE IN EITHER MMA OR THERMOPLASTIC. DO NOT USE ANY TYPE OF RPMS FOR INTERSECTION LINE EXTENSIONS.
- THE INTERSECTION SKETCHES ARE NOT DRAWN TO ANY SCALE. ALL INFORMATION SHOWN IN THE SKETCHES, EXCLUSIVE OF THE INTERSECTION EDGE LINE EXTENSION STRIPE, IS FOR REFERENCE ONLY AND IS NOT INTENDED TO DEPICT ACTUAL CASE CONDITIONS.

NOT TO PS&E QUALITY NOT TO SCALE

WS	DOT-NORTHWEST	REGION
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Washington State
Department of Transportation

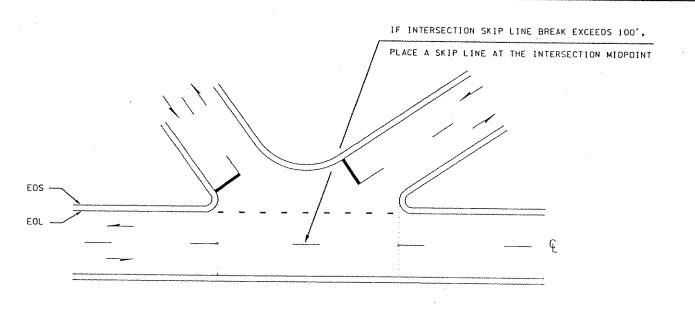
INTERSECTION / DRIVEWAY -EDGE LINE EXTENSION STRIPE DETAILS

REV. 2-26-02 JBR

NW REGION TRAFFIC OPERATIONS

SHEET 1 3 SHEET 5

PLOT1



TYPE C - WIDE INTERSECTION WITH MULTIPLE LEGS ON ONE SIDE

IF MORE THAN ONE SIDE STREET LEG CONVERGES TOGETHER ON THE SAME SIDE OF THE HIGHWAY, IT WILL OFTEN RESULT IN A LARGE UNDEFINED PAVEMENT AREA IN WHICH A MAINLINE DRIVER, AS WELL AS A SIDE STREET DRIVER, MAY NEED GUIDANCE.

DOTTED EXTENSION

2'STRIPE / 6'SKIP PATTERN (TYP)

(MMA OR THERMOPLASTIC)

TYPE D - INTERSECTION ON CURVE

MINIMUM INTERSECTON CENTERLINE

LENGTH OF BREAK

NOMINAL INTERSECTION CENTERLINE

LENGTH OF BREAK

MINIMUM INTERSECTON CENTERLINE

LENGTH OF BREAK

(MMA OR THERMOPLASTIC)

RIGHT TURN TAPER

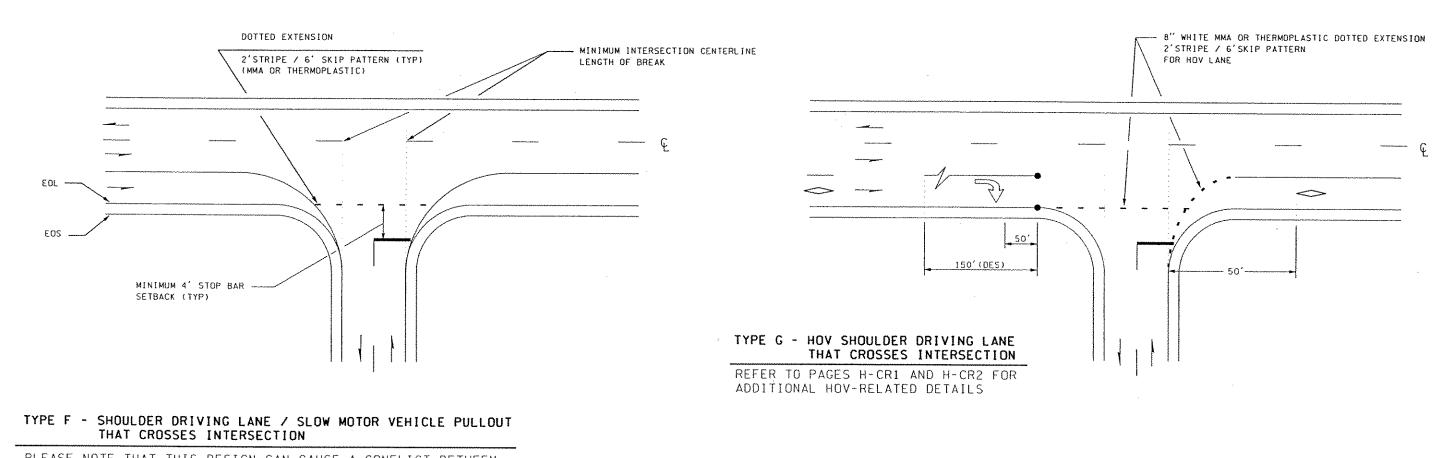
NOT TO PS&E QUALITY NOT TO SCALE

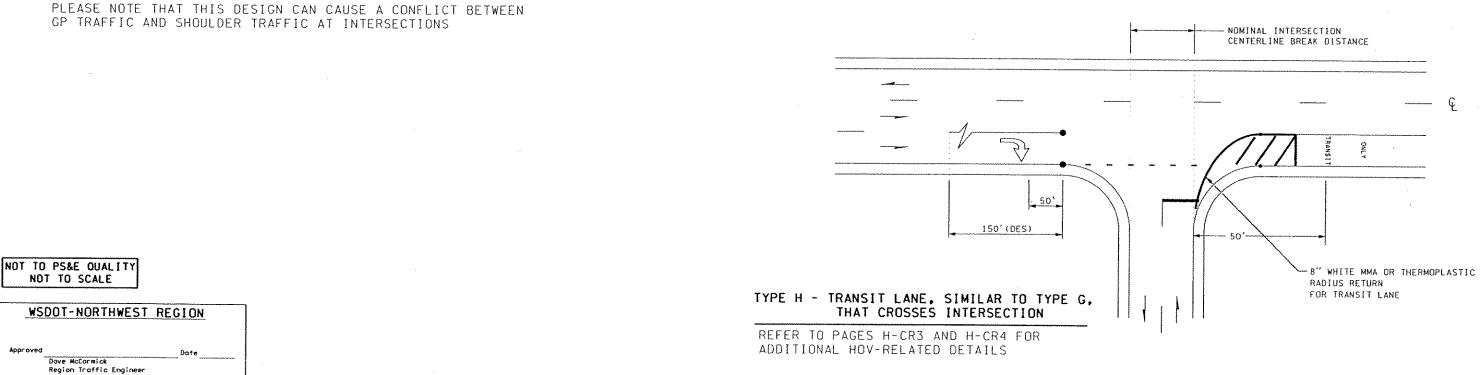
Dave McCormick
Region Traffic Engineer

TYPE E - INTERSECTION ON CURVE WITH RIGHT TURN DECEL TAPER

USE ONLY FOR EXISTING RURAL INTERSECTIONS

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DATE 08/28/2002 DESIGNED BY			REGION STATE MO. 10 WASH JOB NUMBER	FED.AID PROJ.NO.			7	INTERSECTION / DRIVEWAY - EDGE LINE EXTENSION	G-ID6
ENTERED BY CHECKED BY PROJ. ENGR.			CONTRACT NO.	LOCATION MG.			Washington State Department of Transportation	STRIPE DETAILS REV. 2-26-02 JBR	SHEET 2 OF
REGIONAL ADM.	REVISION	DATE BY			P.E. STAMP BOX	DATE P.E. SYAMP BOX		NW REGION TRAFFIC OPERATIONS	3 SHEETS





P.E. STAMP BOX

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REGION STATE FED.AID PROJ.NO.

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JOS NUMBER

CONTRACT NO.

DATE

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PLOT1

G-107

INTERSECTION / DRIVEWAY -

NW REGION TRAFFIC OPERATIONS

Washington State

Department of Transportation

EDGE LINE EXTENSION STRIPE DETAILS

REV. 2-26-02 JBR

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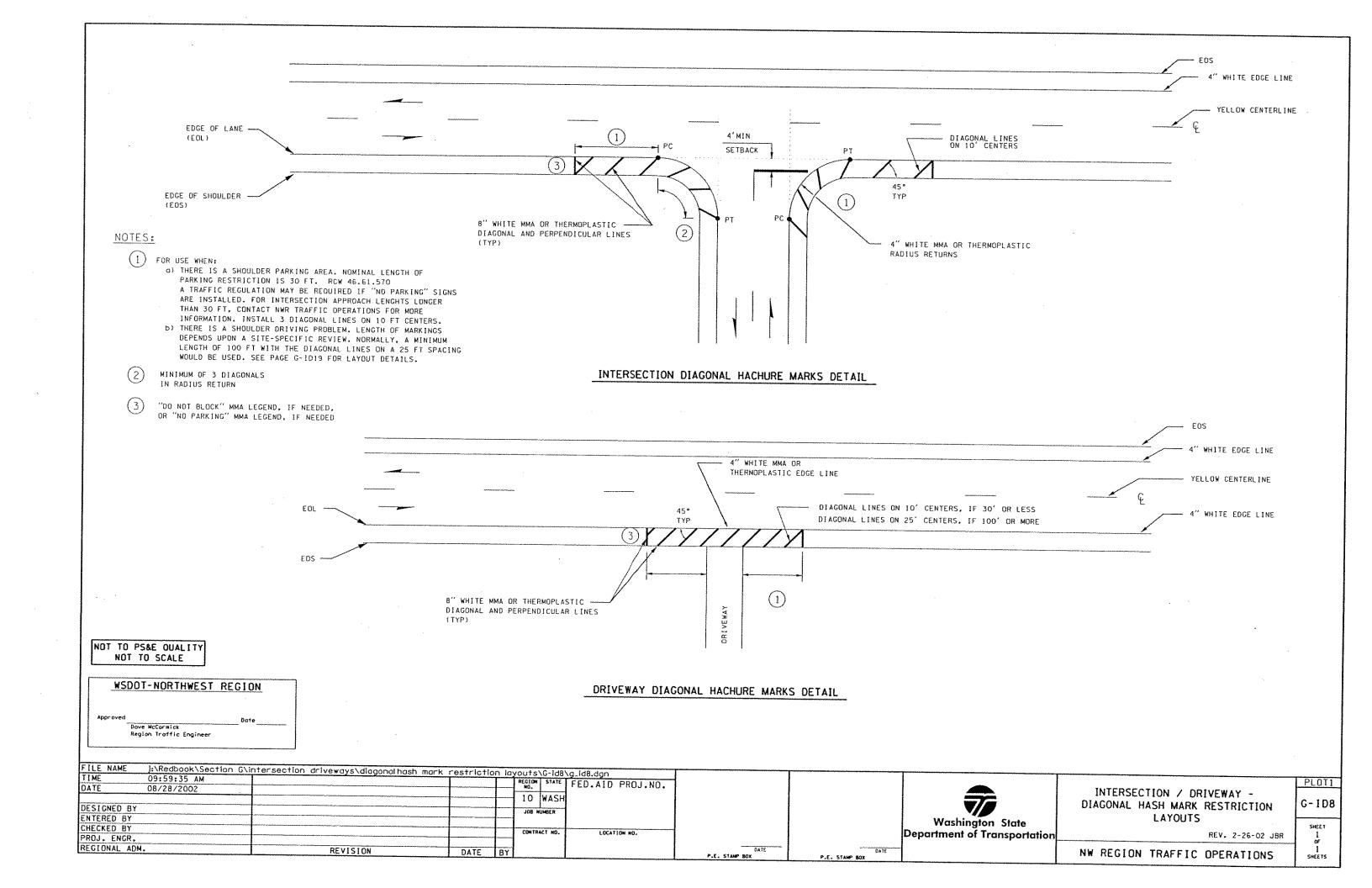
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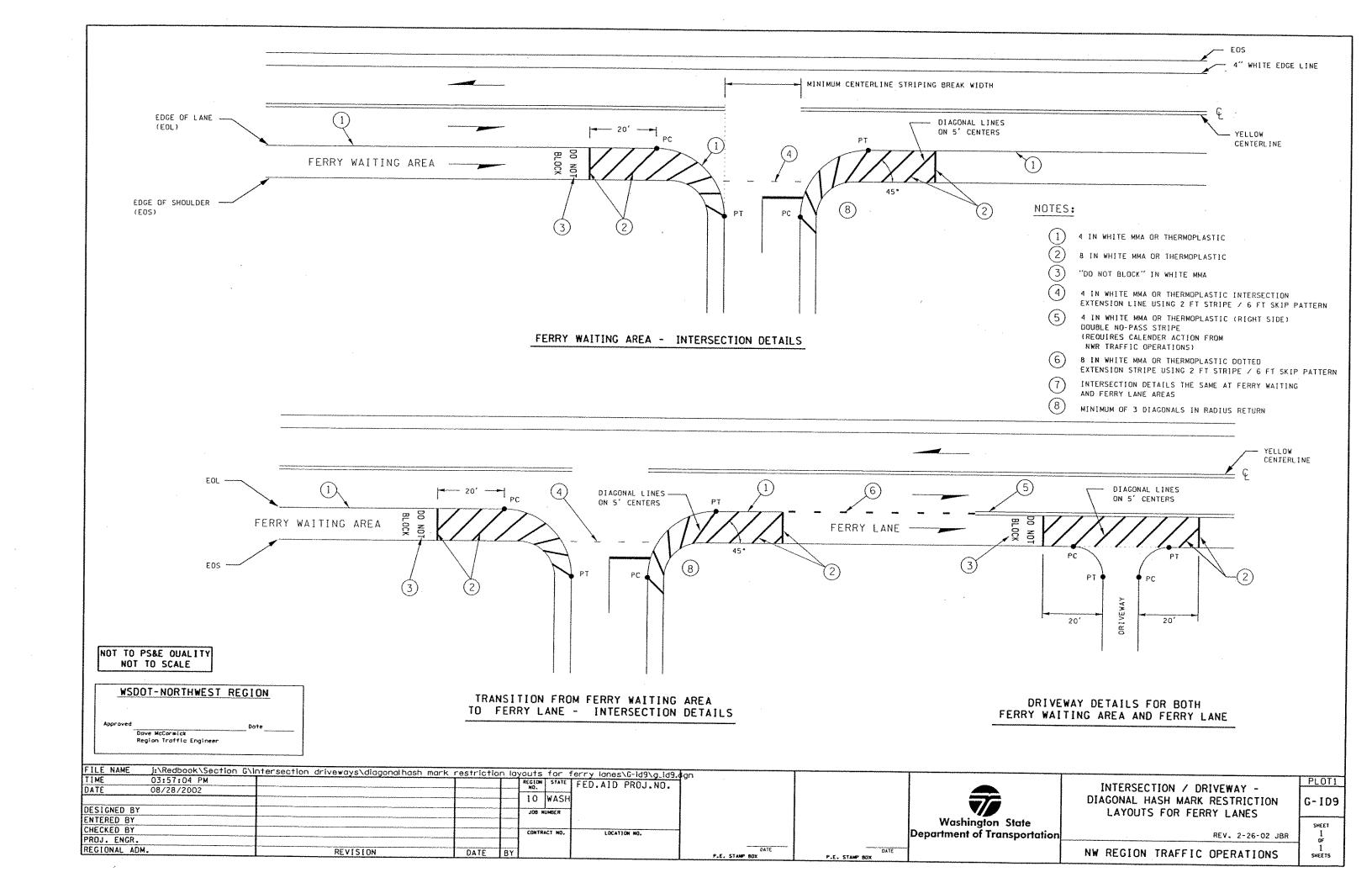
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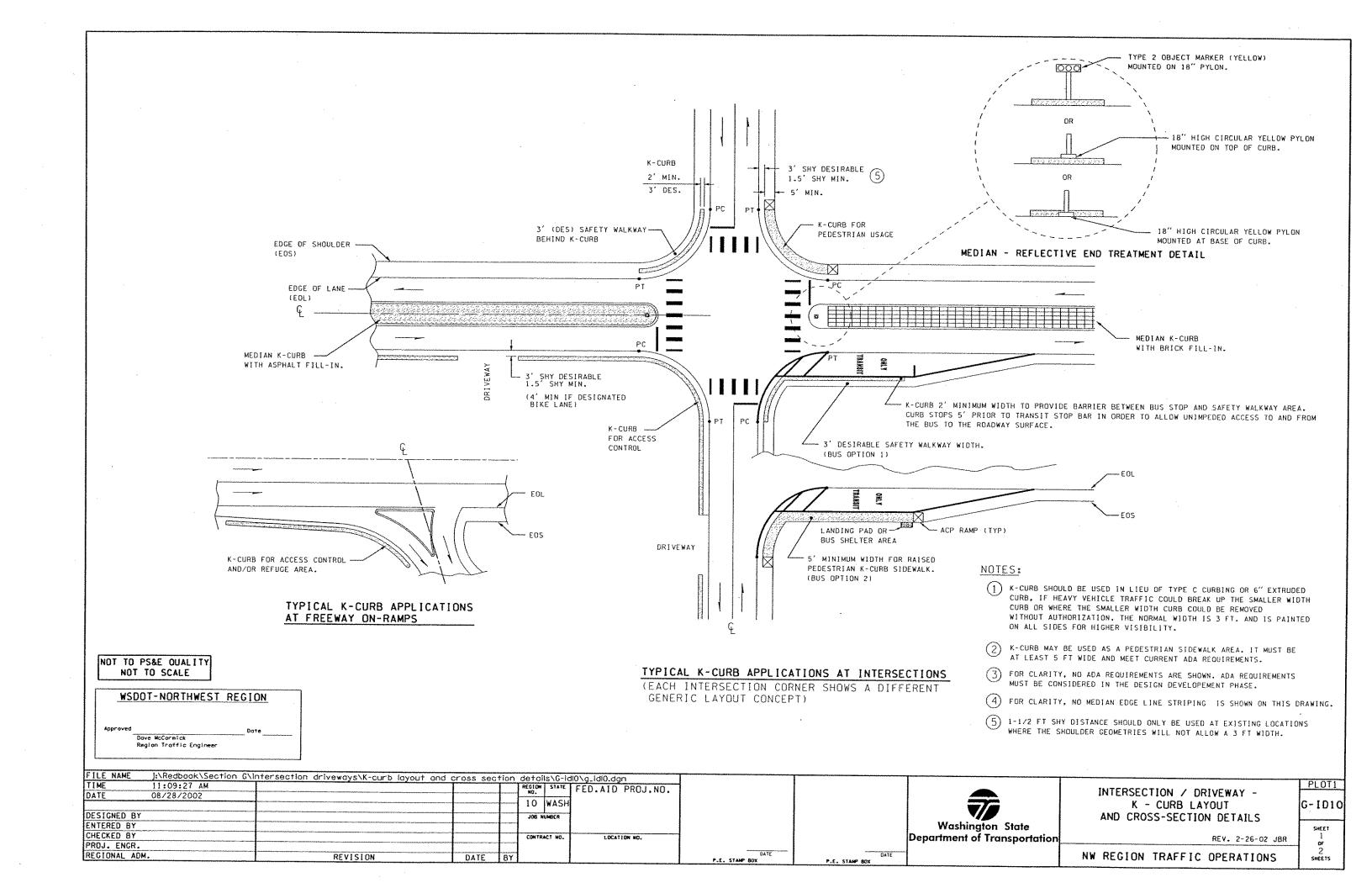
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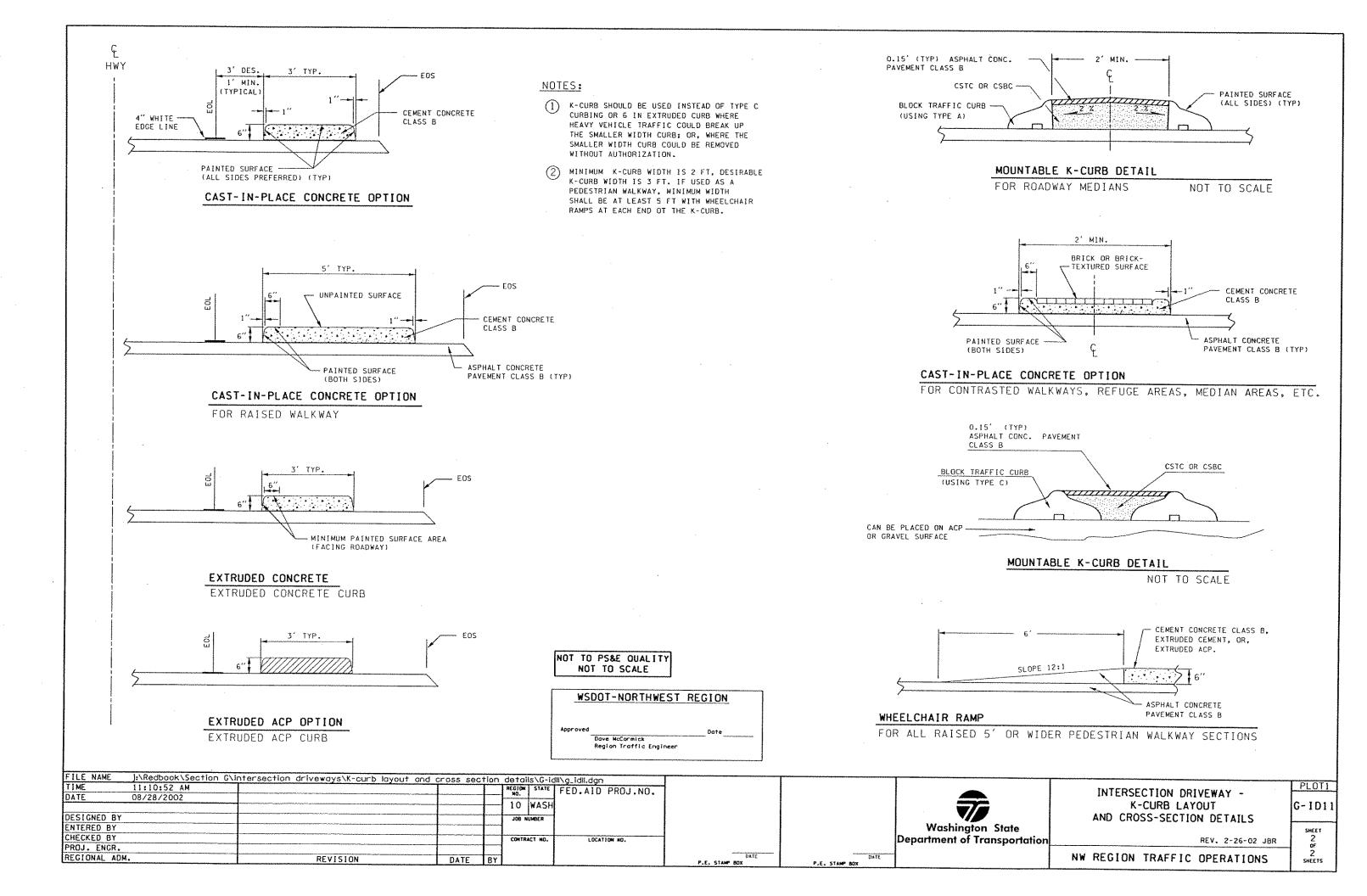
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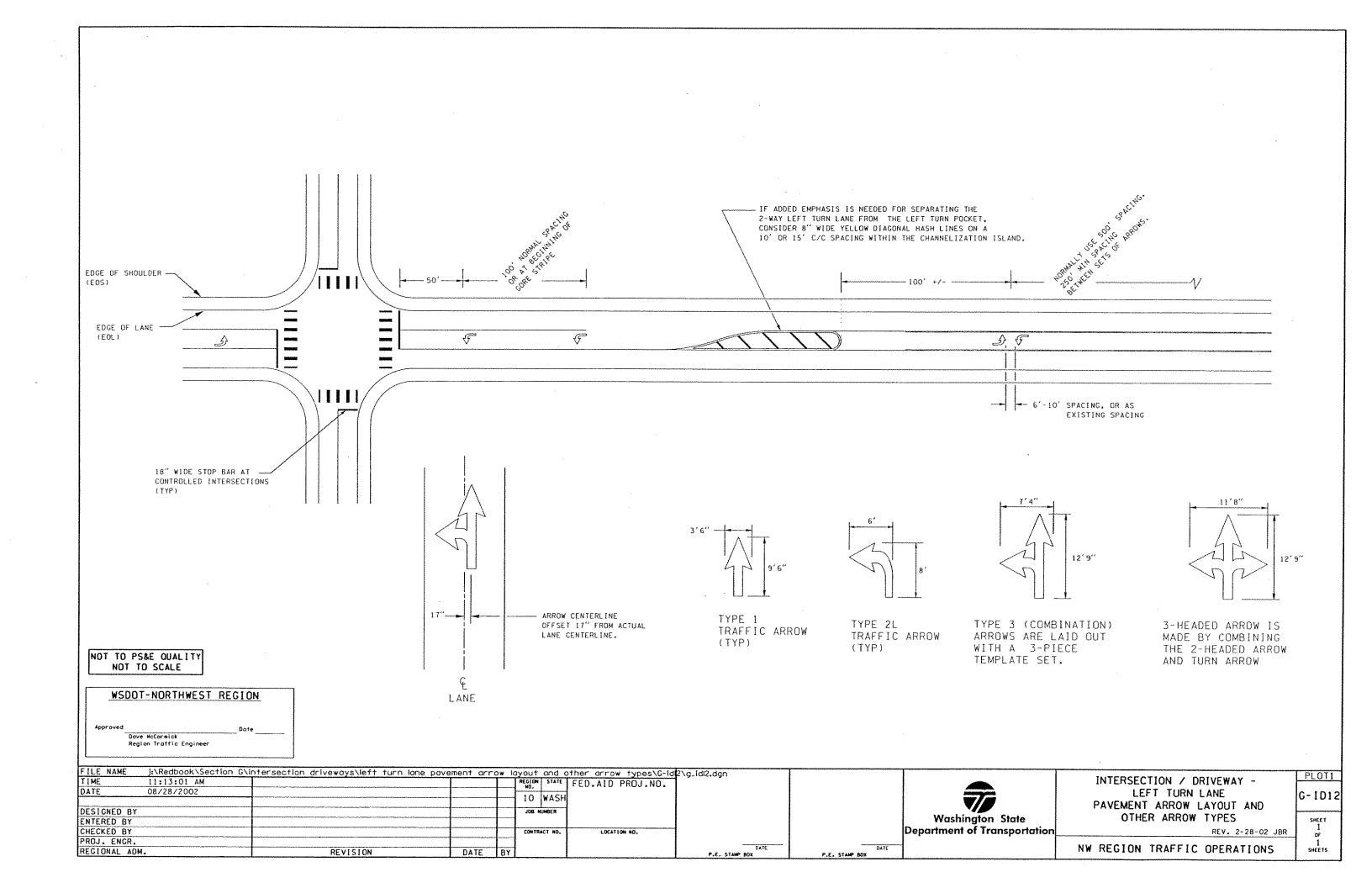
REGIONAL ADM.

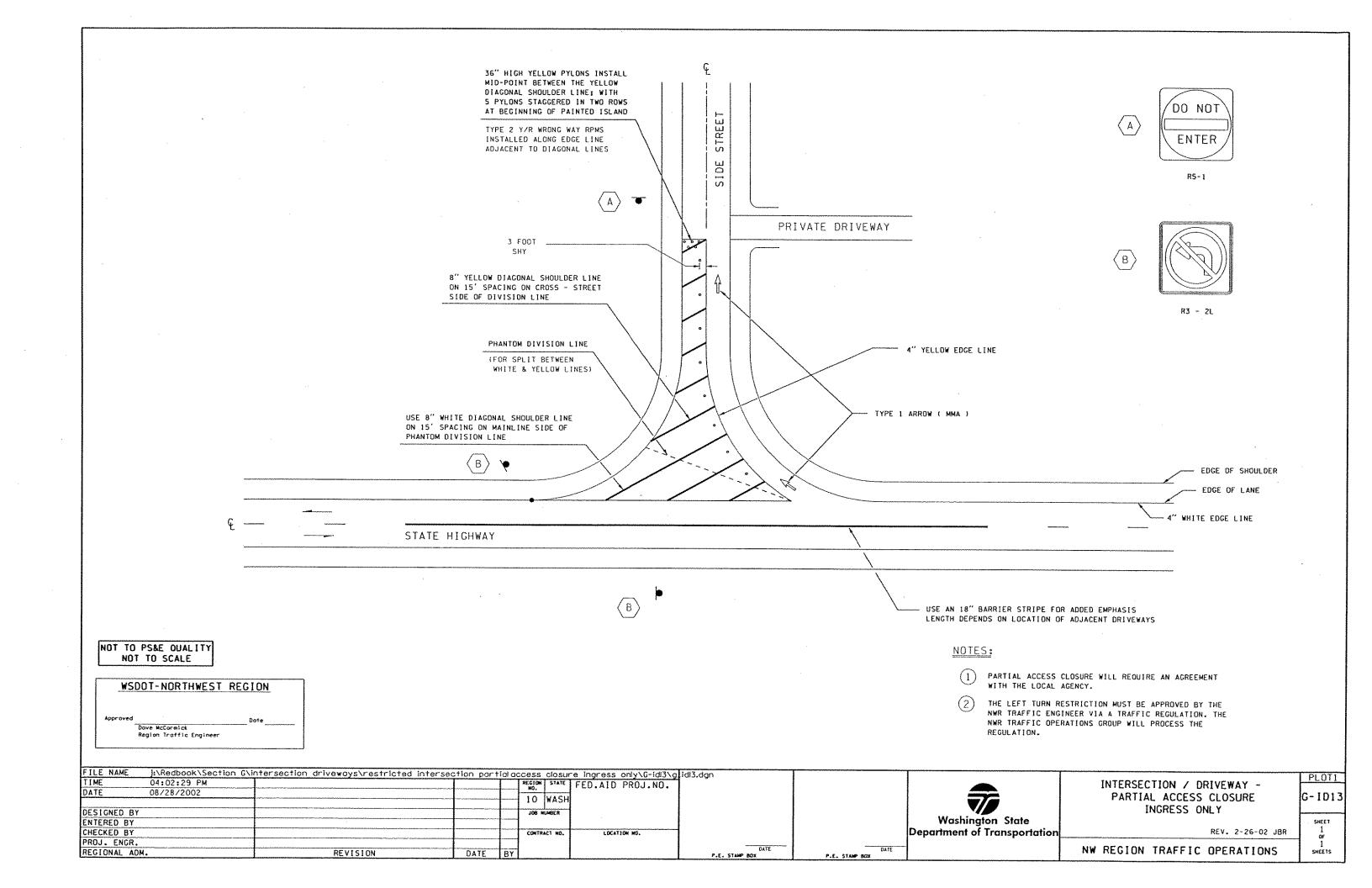


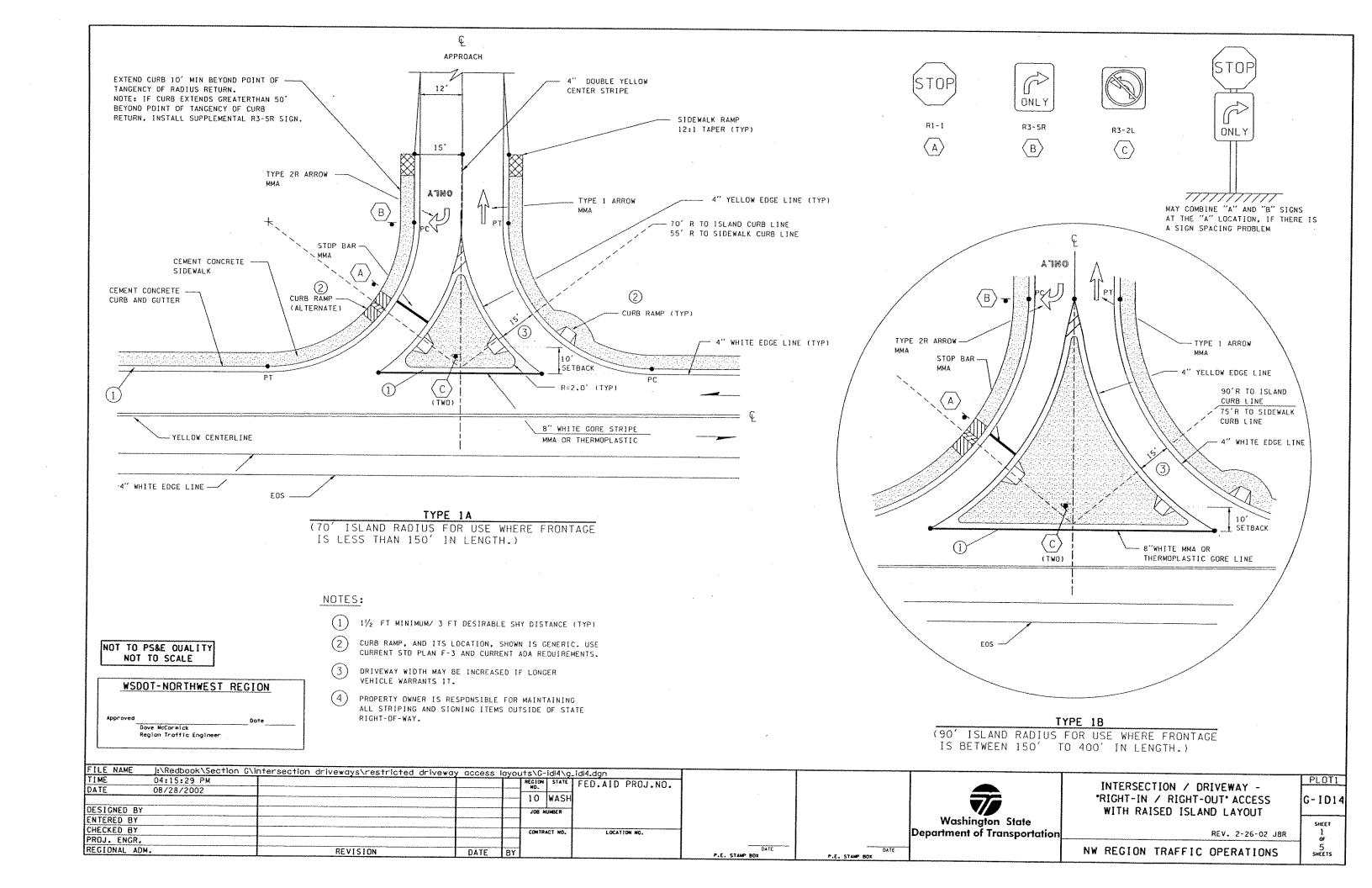


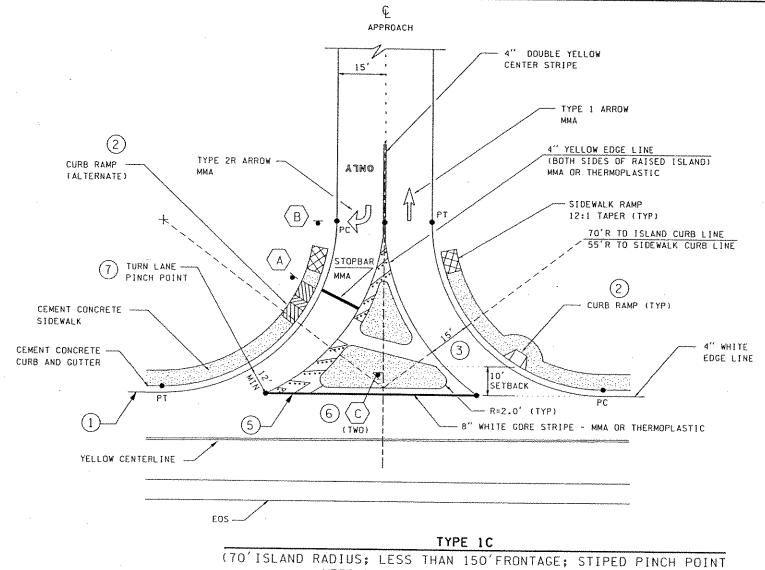












MEDIAN ISLAND BREAK FOR PEDESTRIANS.)

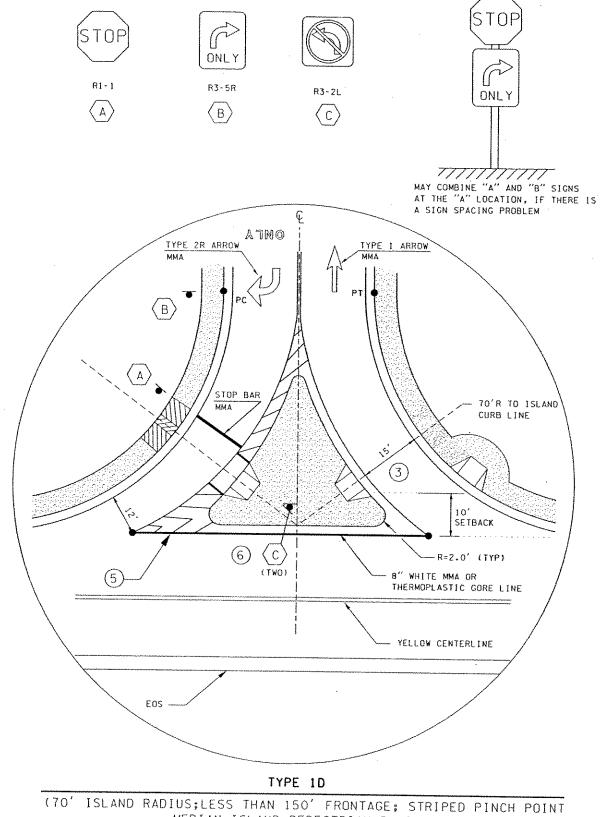
NOTES:

- (1) 1/2 FT MINIMUM/ 3 FT DESIRABLE SHY DISTANCE (TYP)
- CURB RAMP, AND ITS LOCATION, SHOWN IS GENERIC. USE CURRENT STD PLAN F-3 AND CURRENT ADA REQUIREMENTS.
- DRIVEWAY WIDTH MAY BE INCREASED IF LONGER VEHICLE WARRANTS IT.

NOT TO PS&E QUALITY NOT TO SCALE

WSDOT-NORTHWEST REGION Region Traffic Engineer

- PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING ALL STRIPING AND SIGNING ITEMS OUTSIDE OF STATE RIGHT-OF-WAY.
- FOR GORE POINT CHEVRONS AND DIAGONAL HASH MARK DETAILS, SEE PAGE G-F26.
- THE USE OF TWO 30 IN "NO LEFT TURN" SIGNS MAY REQUIRE INDIVIDUAL POSTS.
- TURN LANE WIDTH REDUCES FROM A TYPICAL 15 FT WIDTH TO A 12 FT WIDTH AT END OF ISLAND, INSTALL DIAGONAL HASH MARKS ON 5 FT CENTERS. 18 IN YELLOW THERMOPLASTIC LINE WITH ADJACENT YELLOW RPM LINE - - . SEE PAGE G-1019 FOR THIS TYPICAL DIAGONAL LINE LAYOUT) FOR USE AS ADDED "RIGHT TURN ONLY" EMPHASIS.



MEDIAN ISLAND PEDESTRIAN RAMPS.)

Washington State

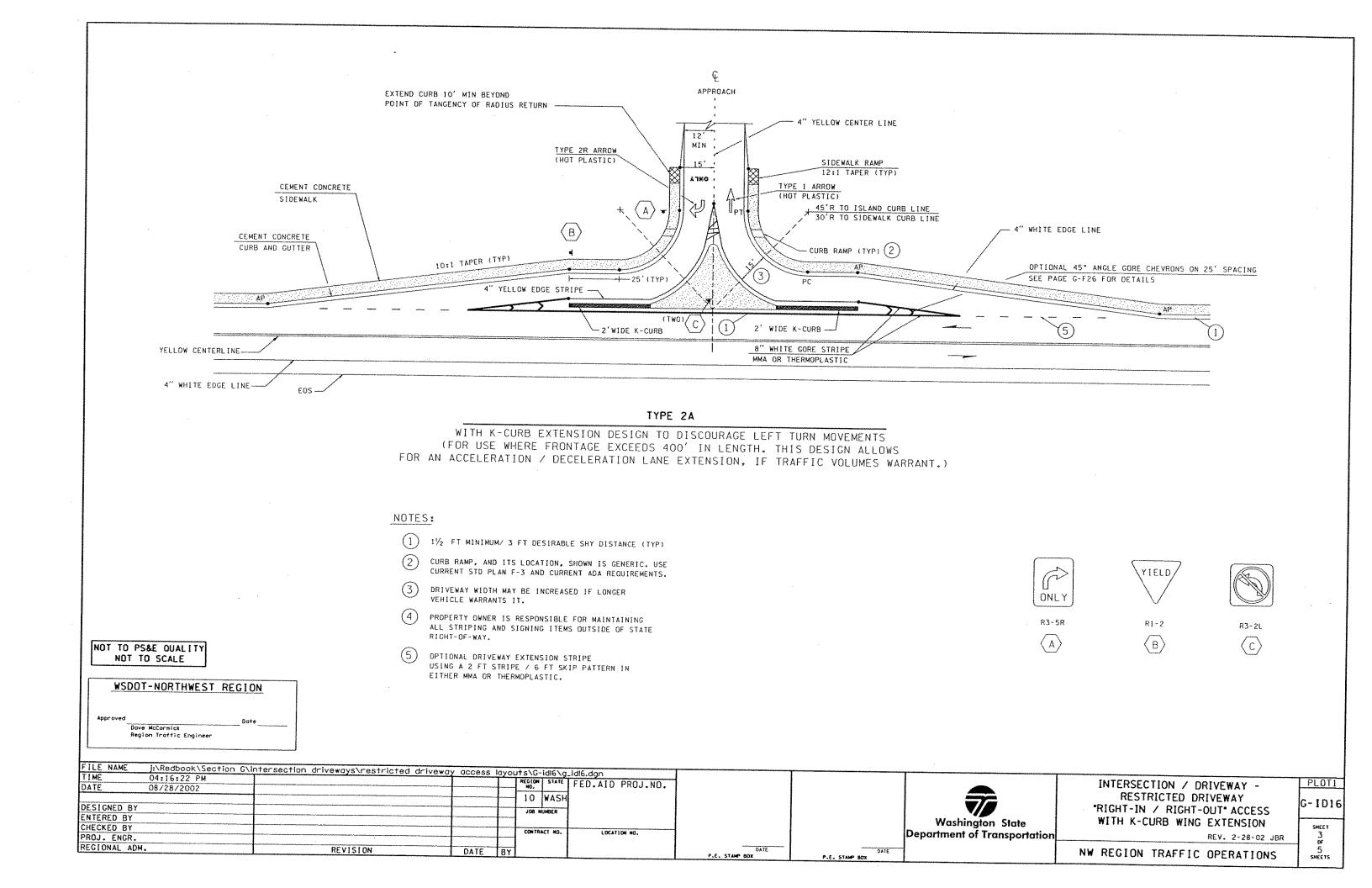
Department of Transportation

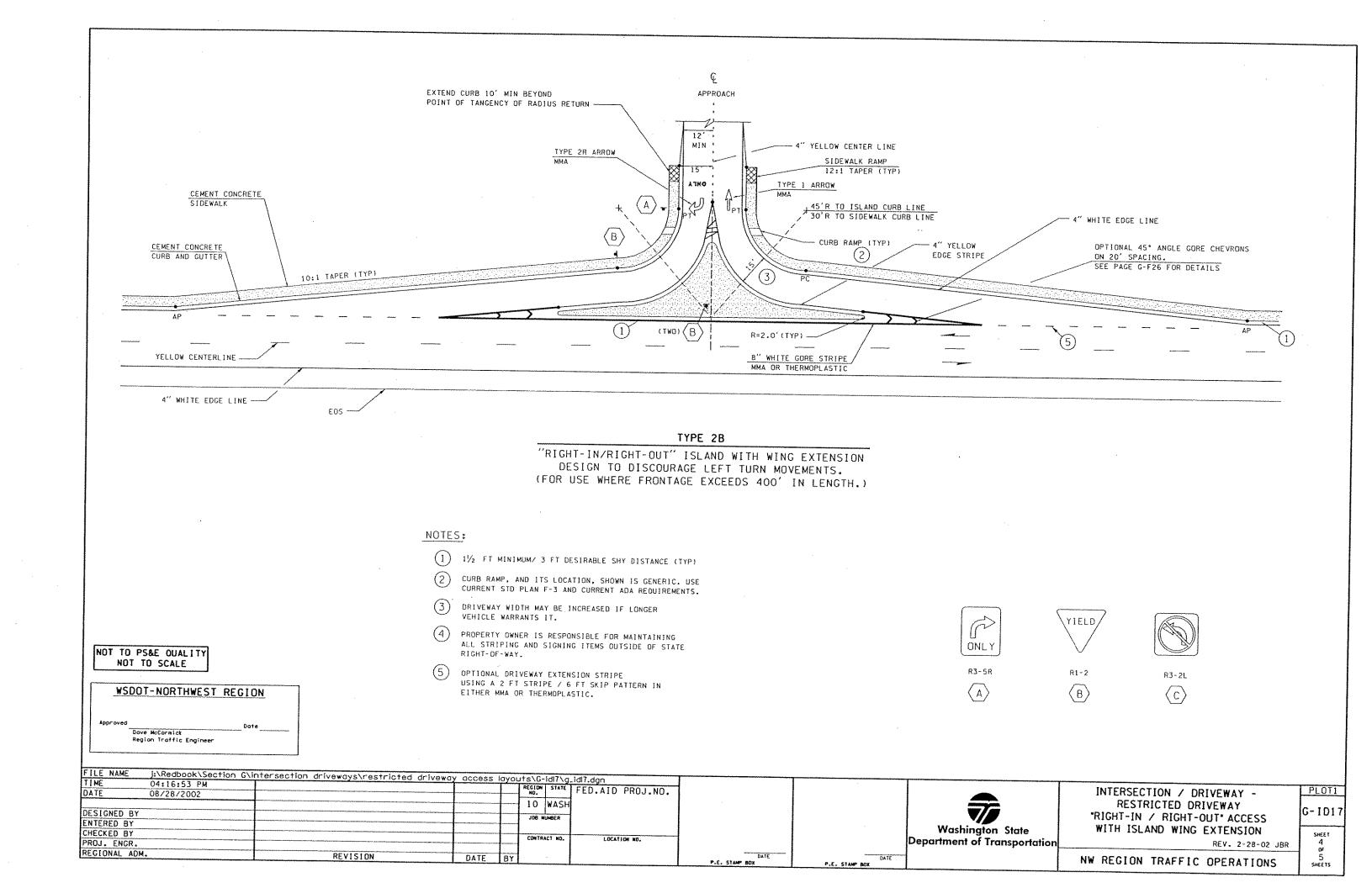
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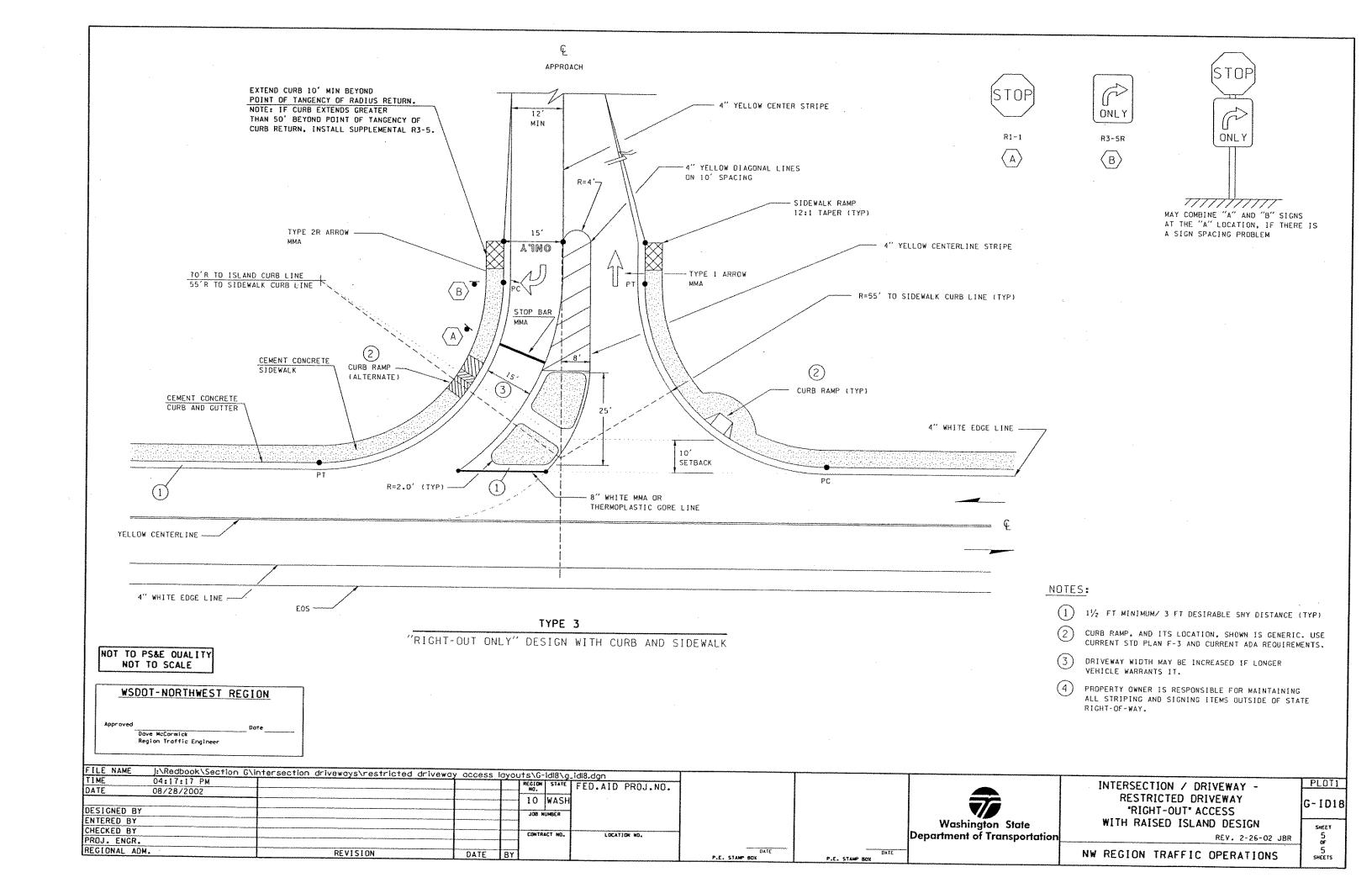
PLOT1 INTERSECTION / DRIVEWAY -RESTRICTED DRIVEWAY G-1015 "RIGHT-IN / RIGHT-OUT" ACCESS RAISED ISLAND WITH STRIPED PINCH POINT

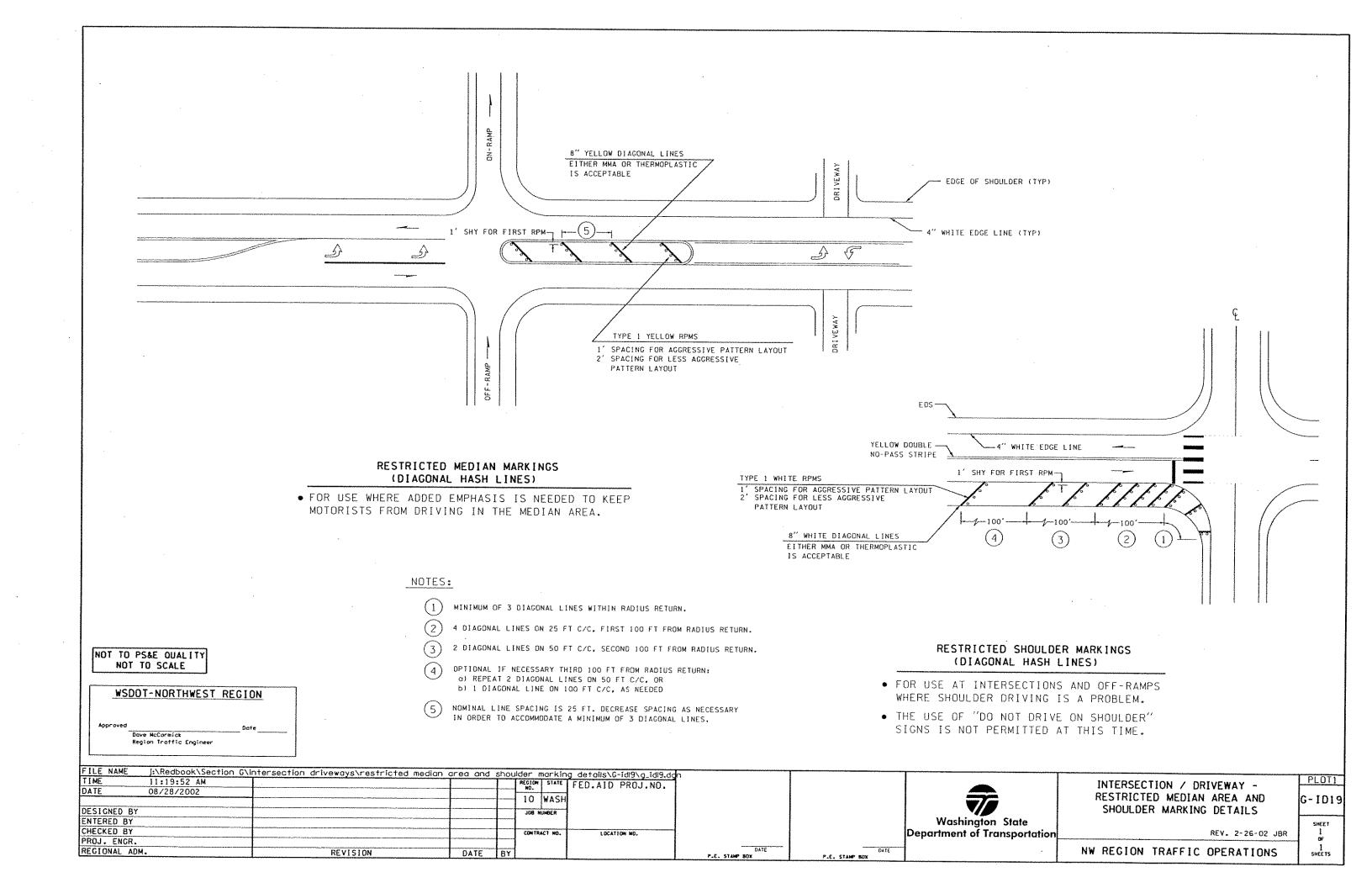
5 SHEETS NW REGION TRAFFIC OPERATIONS

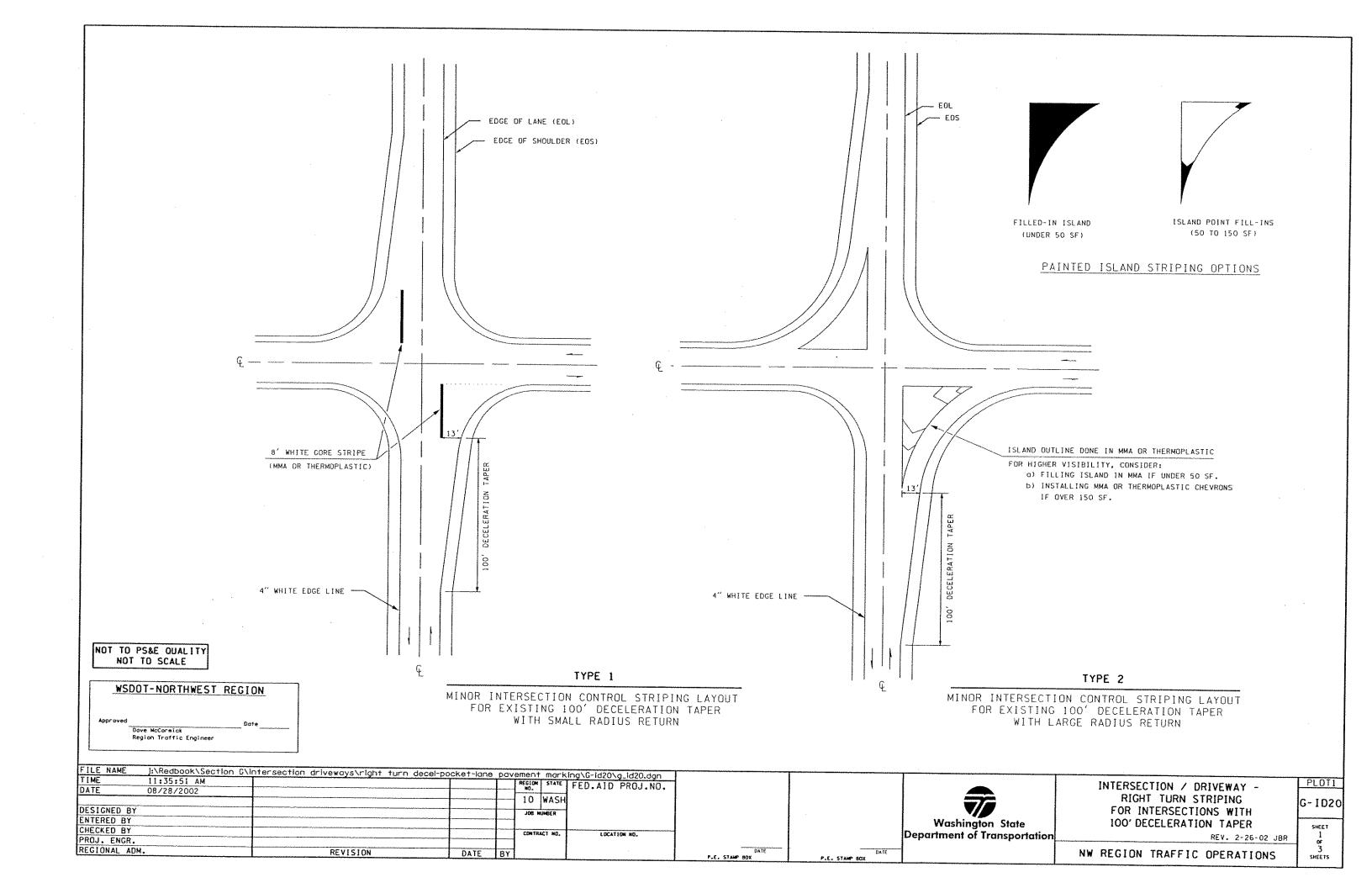
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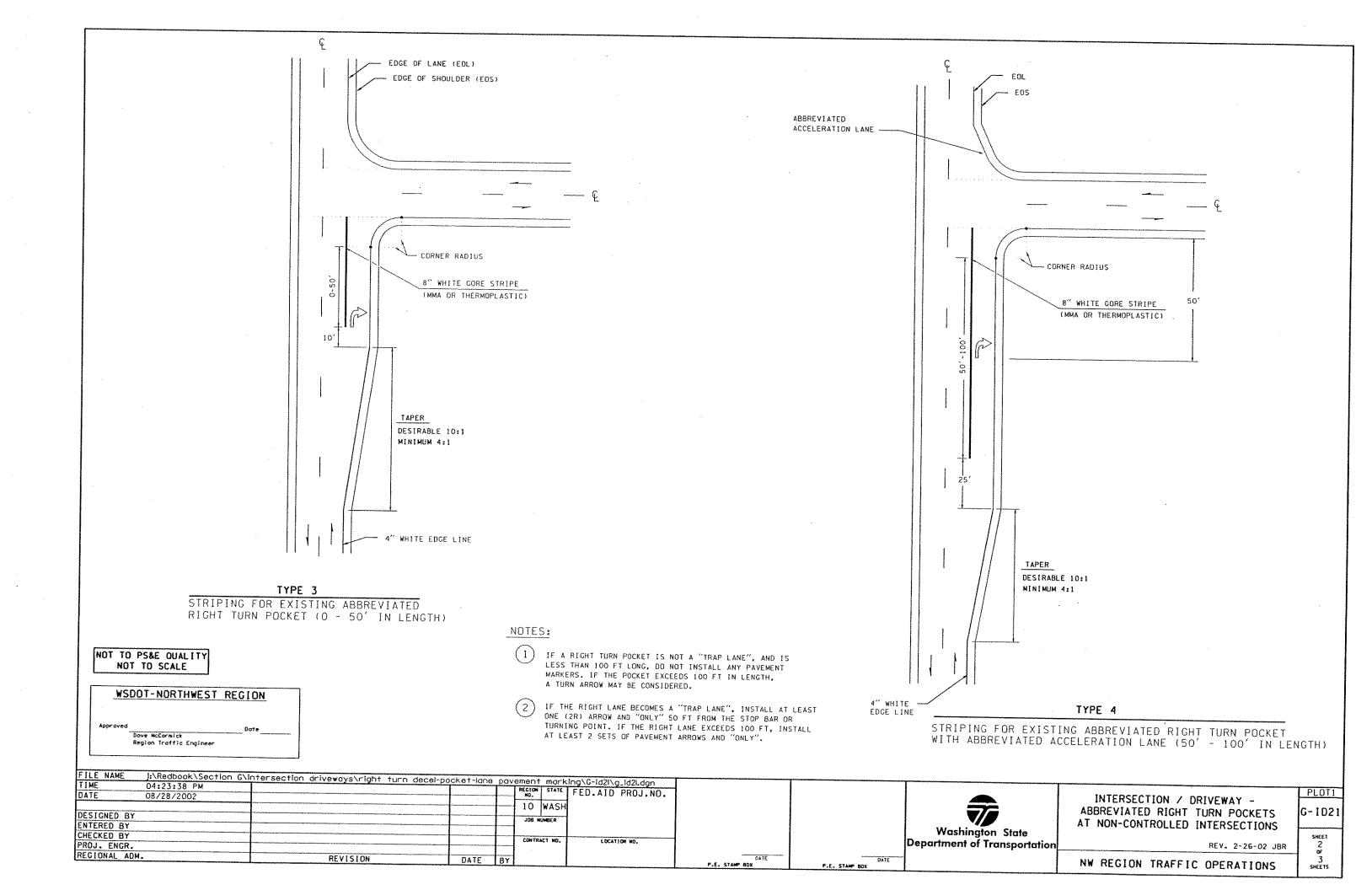


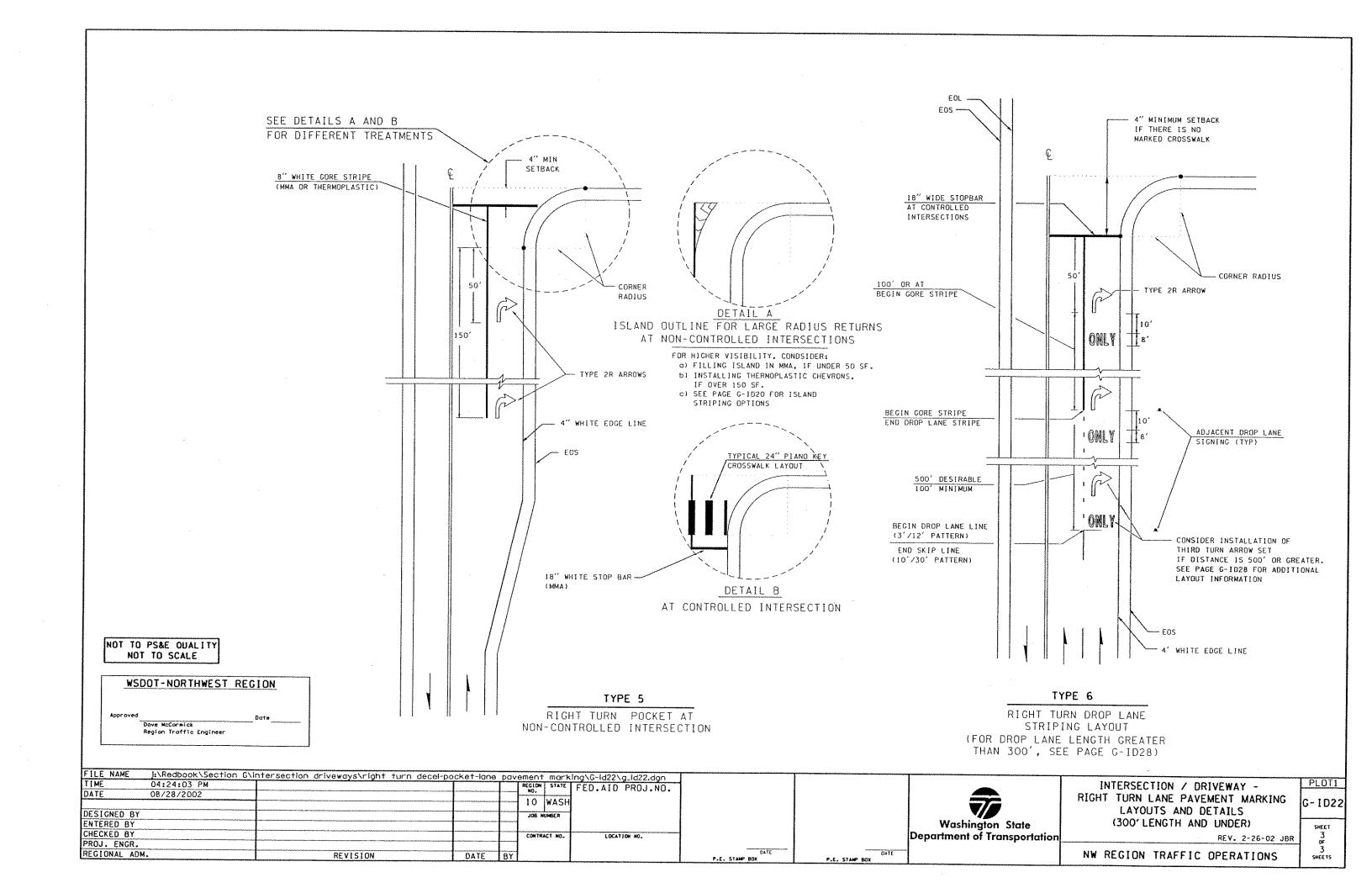






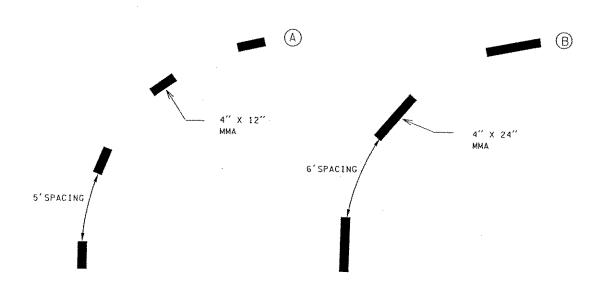






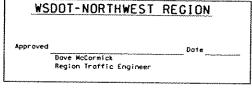
NOTES:

- 1) A VEHICLE TURNING RADIUS GUIDE (CHICKEN FOOTPRINTS)
 IS ALWAYS REQUIRED BETWEEN PARALLEL (DOUBLE LANE)
 TURNING MOVEMENTS.
- (2) CHICKEN FOOTPRINTS ARE OCCASIONALLY USED TO DELINEATE A SINGLE LEFT TURN MOVEMENT THROUGH AN INTERSECTION IF IT IS SEVERLY SKEWED. SEE PAGE G-1026 FOR EXAMPLES. CONSULT WITH NWR TRAFFIC OPERATIONS TO SEE IF WARRANTED.
- (3) CHICKEN FOOTPRINT LAYOUTS SHOULD BE DONE USING METHYL METHACRYLATE MATERIAL. THERMOPLASTIC MATERIAL IS ACCEPTABLE, IF OK'D BY NWR TRAFFIC OPERATIONS.
 - METHLYMETHACRYLATE MUST BE USED WHERE THERE ARE HIGH TRUCK TURNING VOLUMES.
 - b) THERMOPLASTIC MATERIAL SHOULD NOT BE USED IN SNOW ZONE AREAS OR AREAS WHERE GRADERS AND ICE CHISEL MACHINERY ARE USED TO REMOVE RDADWAY SNOW/ICE.
 - c) THE USE OF RPMS (CHICKEN TRACKS) HAS BEEN DISCONTINUED DUE TO SHORTER SERVICE LIFE AND IT'S NON-REFLECTIVE SURFACE.
- 4) FOOTPRINT LAYOUTS CAN BE EITHER OF THE 2 LAYOUTS LISTED BELOW.



TYPICAL 5' AND 6' TURNING PATH LAYOUTS

NOT TO PS&E QUALITY
NOT TO SCALE



INSTALL THE FIRST CHICKEN FOOTPRINT 5' -BEYOND THE LEADING CROSSWALK EDGE TANGENT WITH THE LANE LINE. BEGIN THE TURNING PATH AT THAT POINT. - "A" LAYOUT VEHICLE TURNING PATH RADIUS (WHITE CHICKEN FOOTPRINTS) \$ "B" LAYOUT

EXAMPLE 1

BASIC LAYOUT SHOWING THE "A" AND "B" PATTERNS

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Washington State
Department of Transportation

DATE

P.E. STAMP BOX

P.E. STAMP BOX

INTERSECTION / DRIVEWAY -VEHICLE TURNING PATH LAYOUT (CHICKEN FOOTPRINT DETAIL)

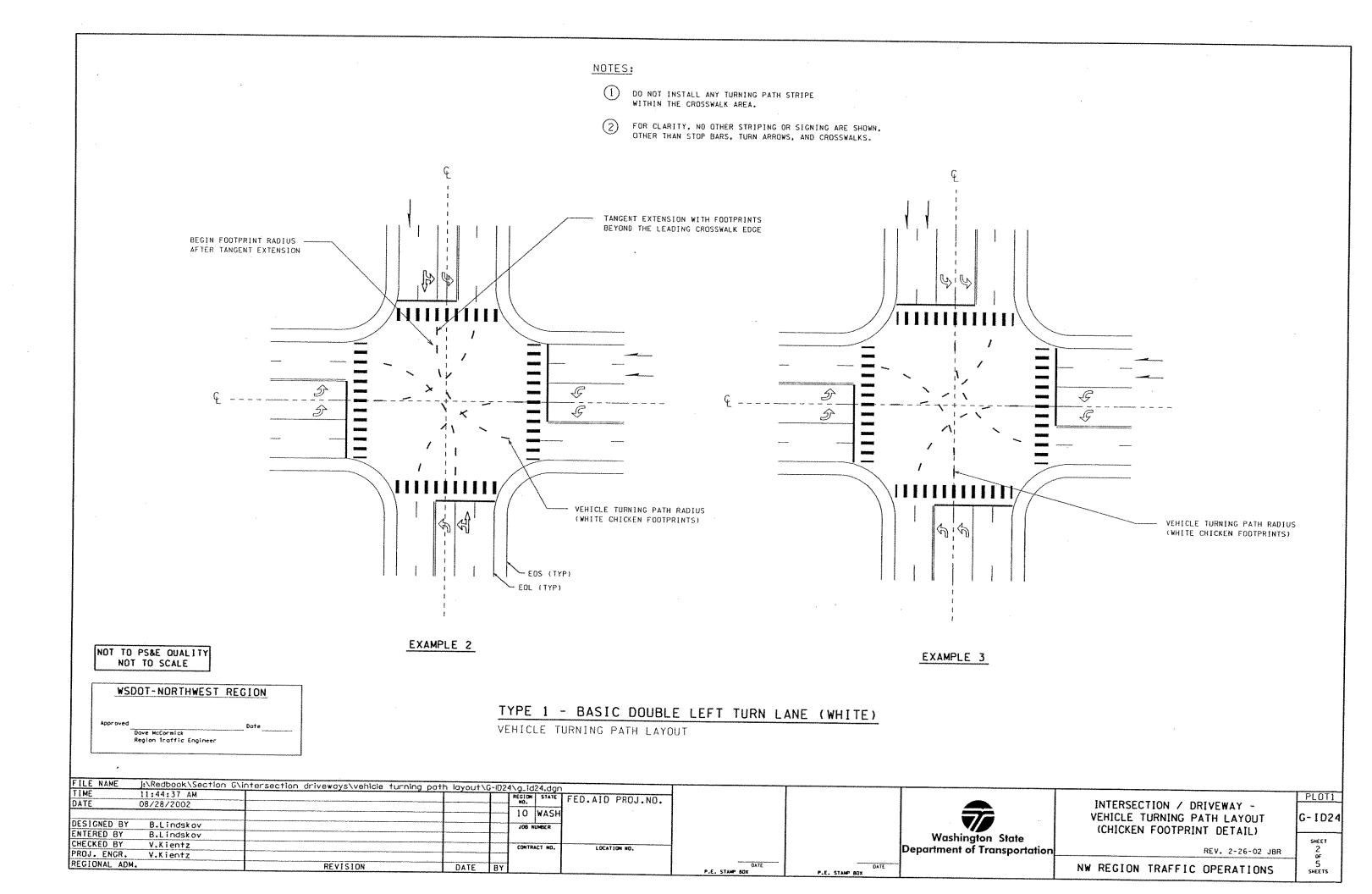
REV. 2-26-02 JBR

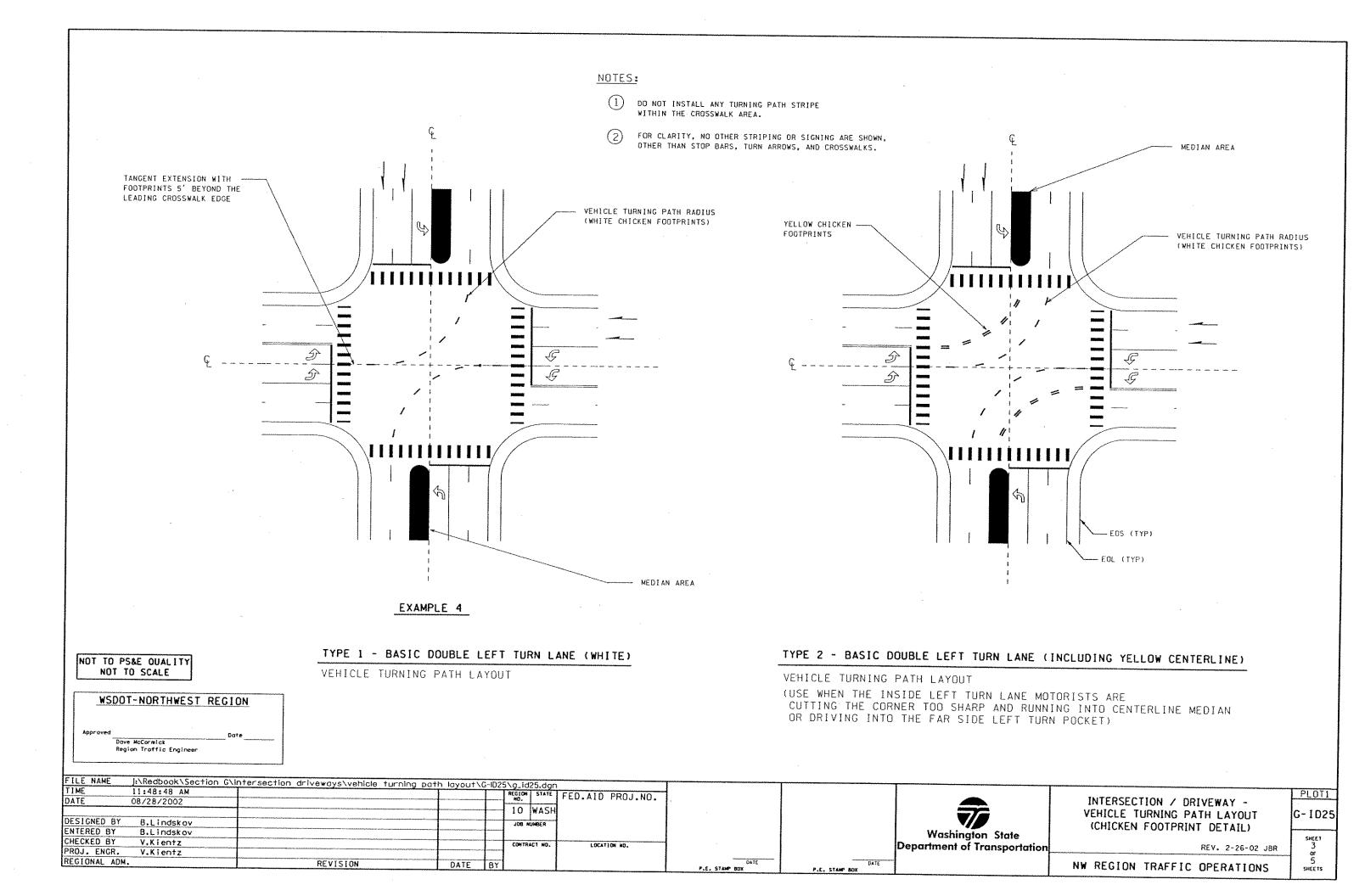
PLOT1

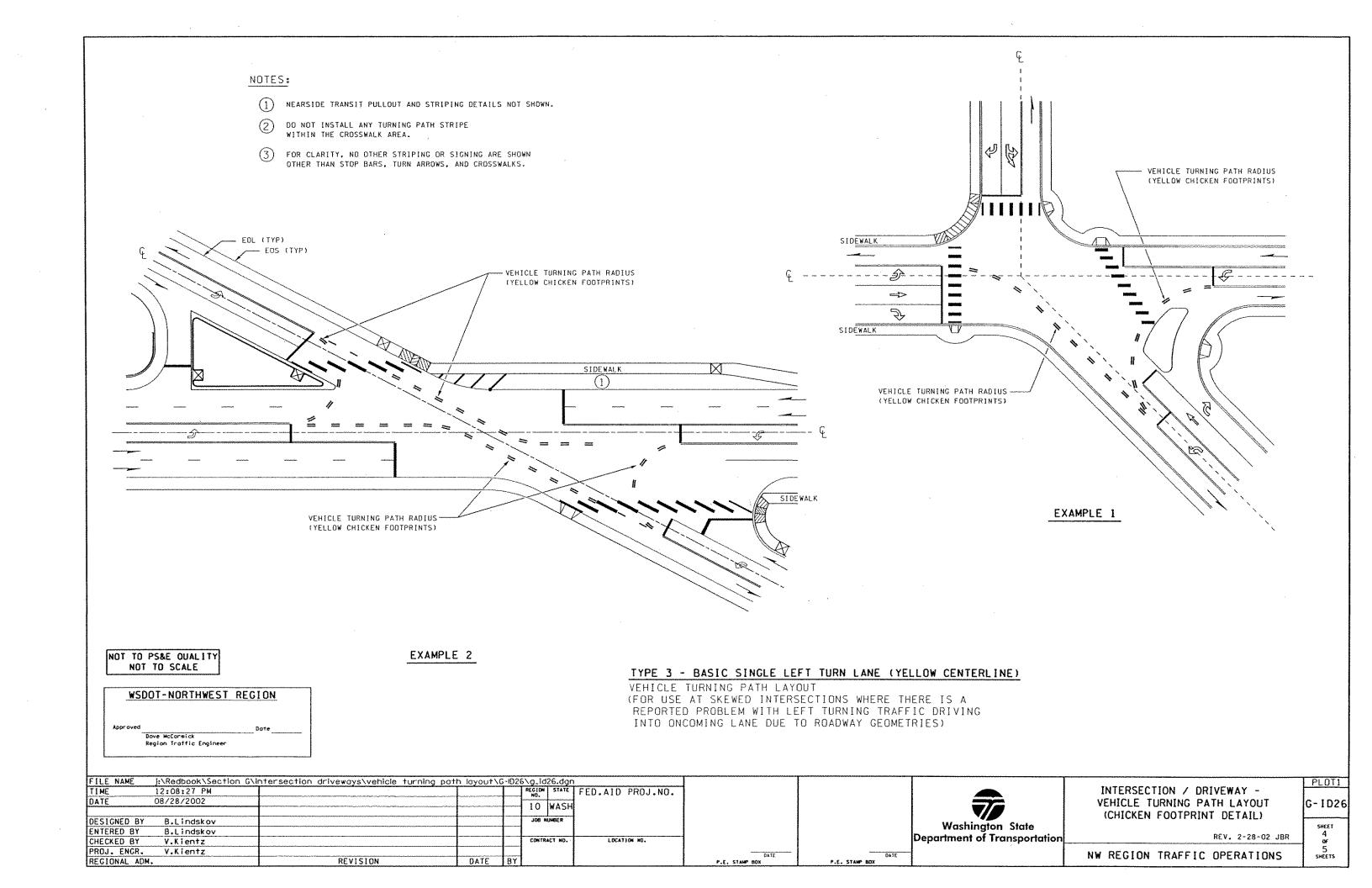
G-1D23

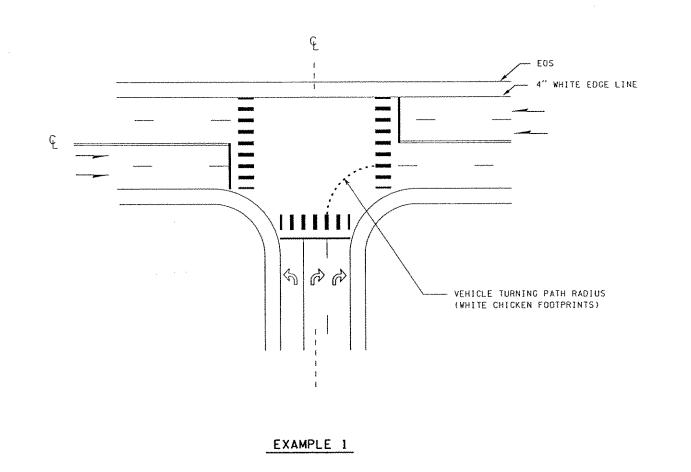
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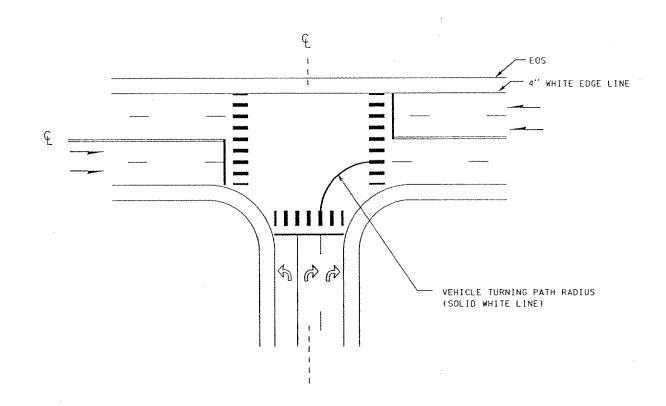
NW REGION TRAFFIC OPERATIONS











EXAMPLE 2

(FOR CONSIDERATION, IF ADDED EMPHASIS IS NEEDED)

NOT TO PS&E QUALITY NOT TO SCALE

WSDOT-NORTHWEST REGION

Approved

Date

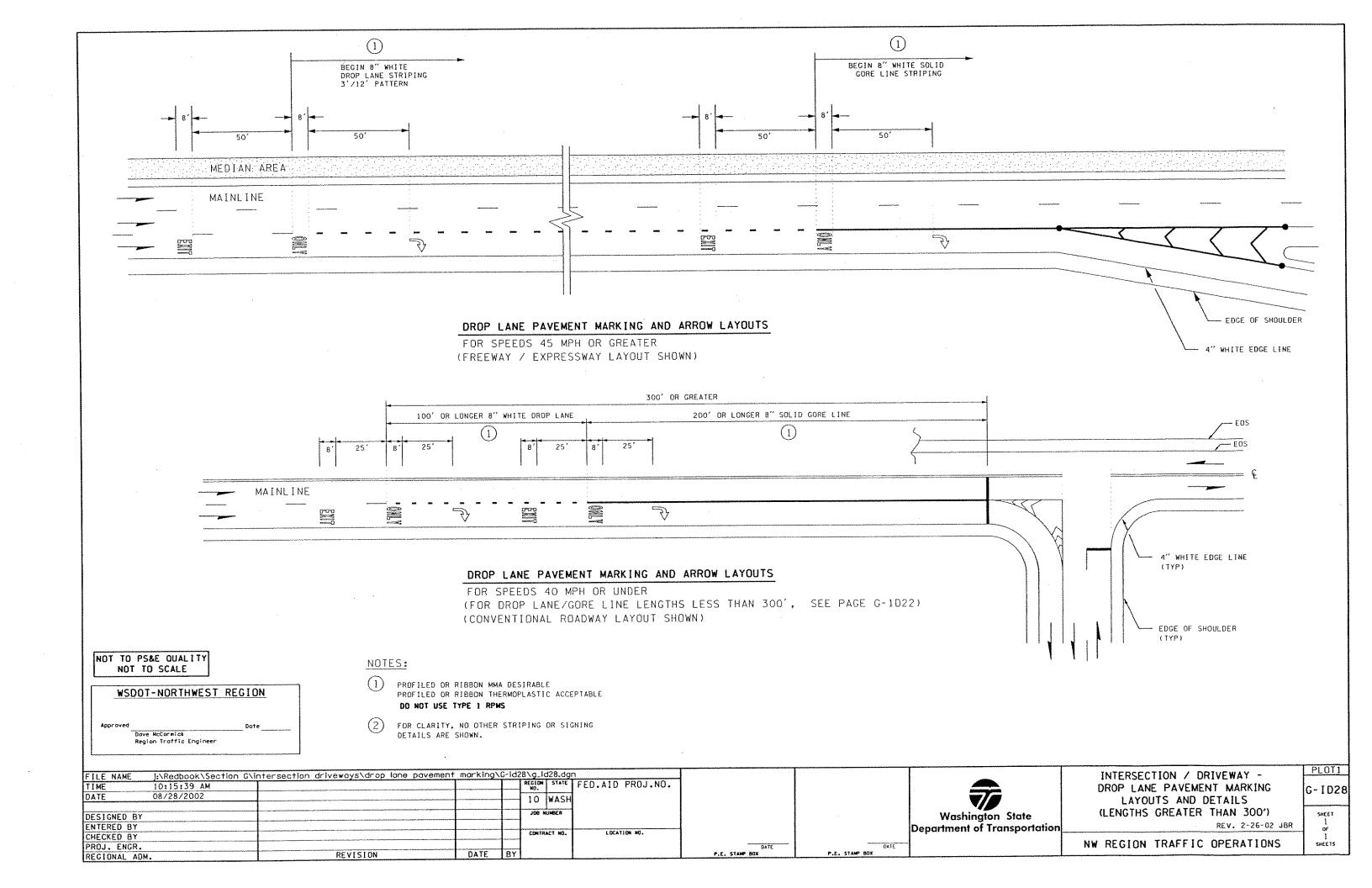
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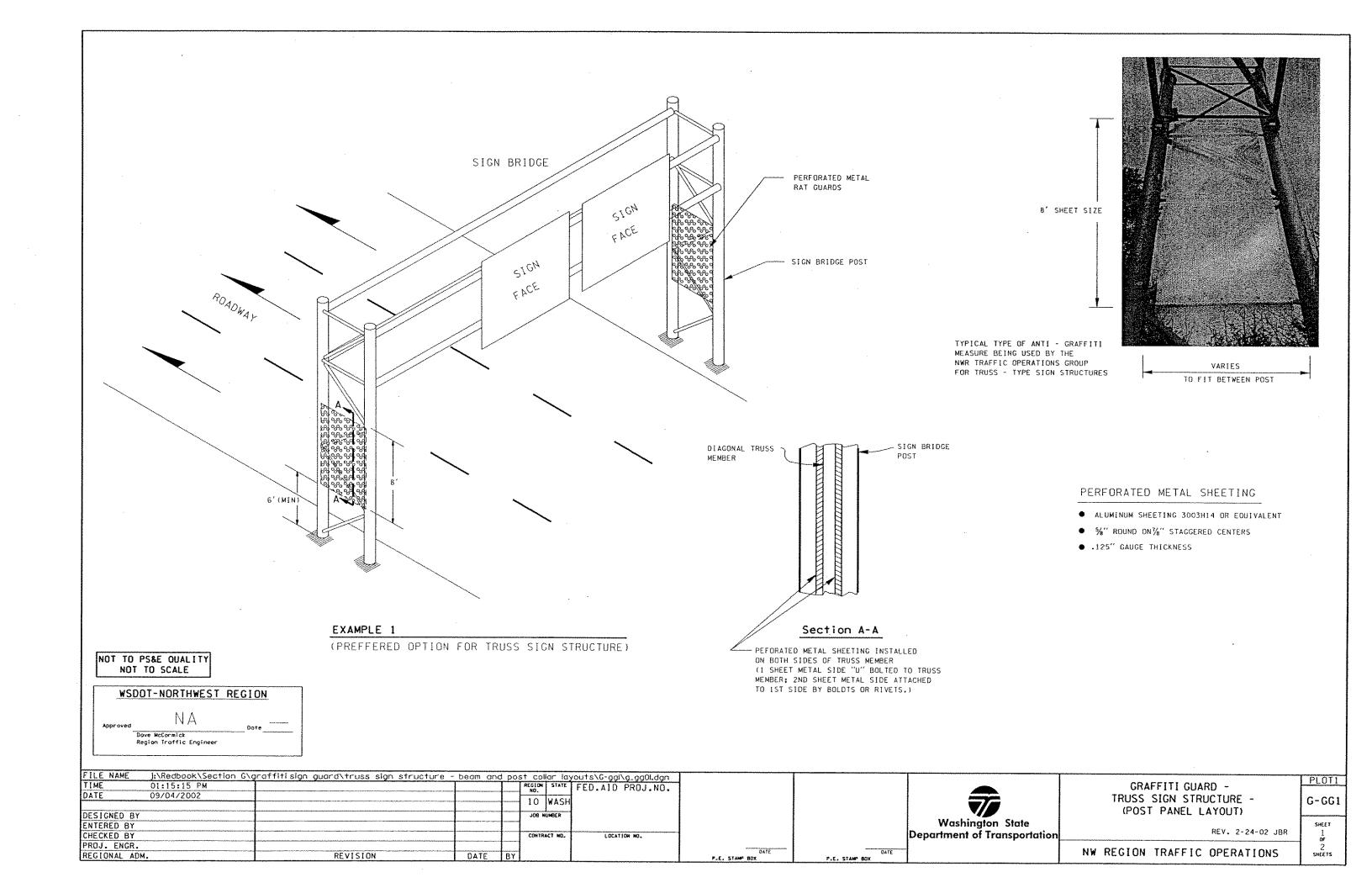
Region Traffic Engineer

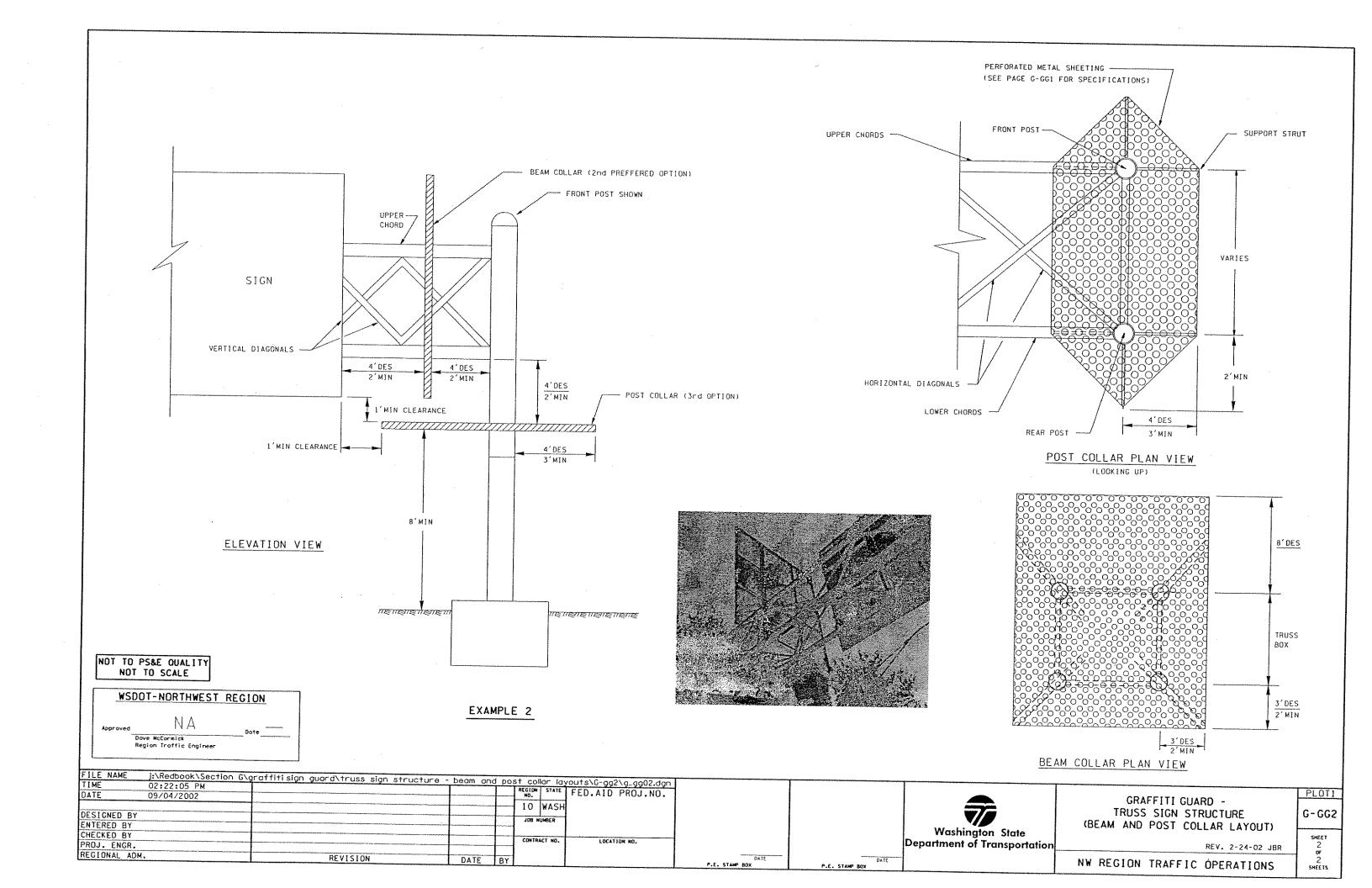
TYPE 4 - BASIC DOUBLE RIGHT TURN LANE (WHITE)

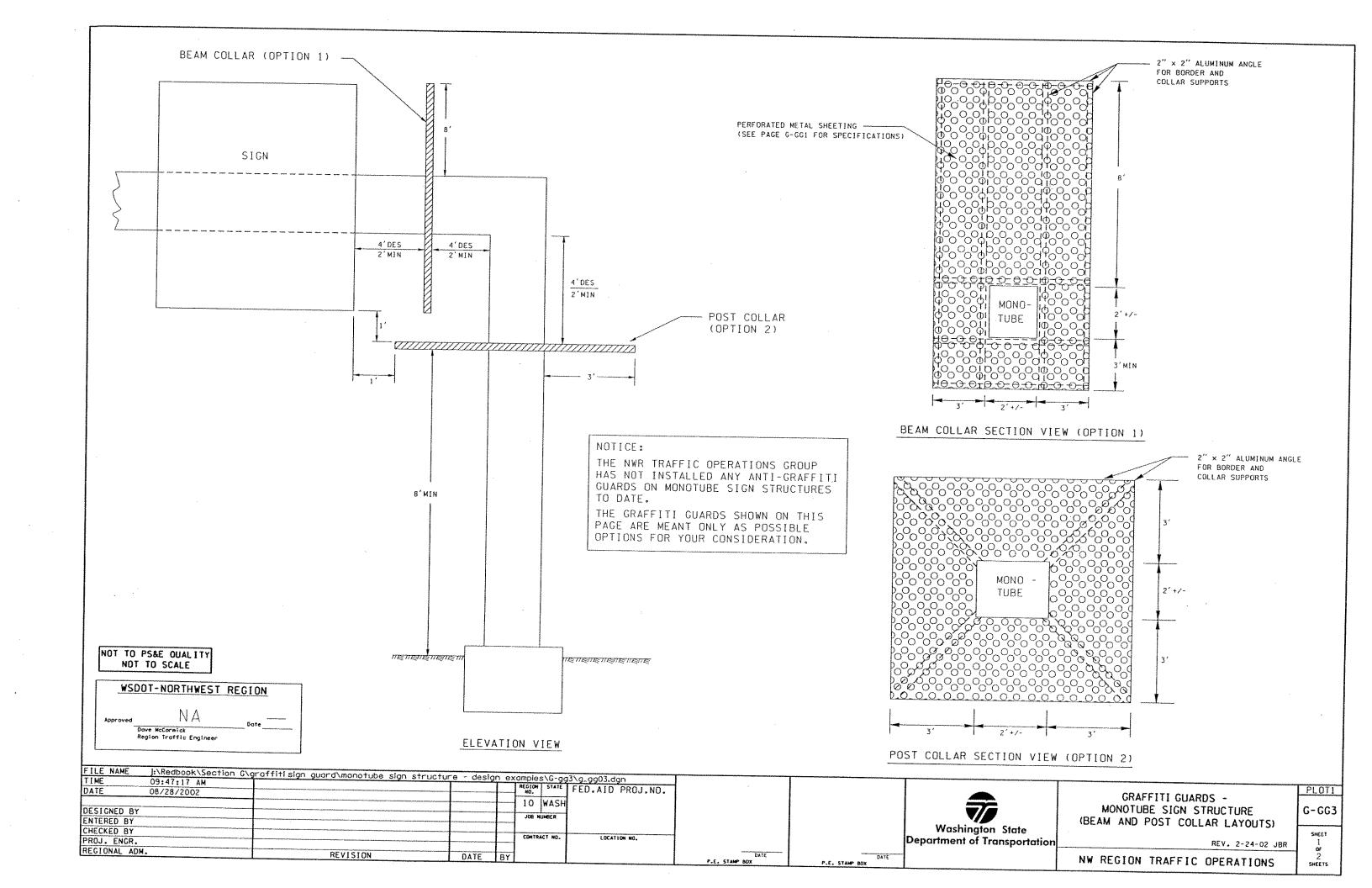
VEHICLE TURNING PATH LAYOUT
(AT OFF-RAMPS OR T-INTERSECTIONS)

ì										
FILE NAME	j:\Redbook\Section G\	intersection driveways\vehicle turning po	ath layout\G-l							PLOT1
TIME	12:02:50 PM	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		REGION STAT	FED.AID PROJ.NO.				INTERSECTION / DRIVEWAY -	
DATE	08/28/2002			10 WAS					VEHICLE TURNING PATH LAYOUT	G-1027
								· •	(CHICKEN FOOTPRINT DETAIL)	
DESIGNED BY	B.Lindskov			JOB NUMBER				Washington State		SHEET
ENTERED BY	B.Lindskov							Department of Transportation	REV. 2-26-02 JBR	5
CHECKED BY	V.Kientz			CONTRACT NO	. LOCATION NG.			bepariment of transportation		1 2
PROJ. ENGR.	V.Kientz					DATE	DATE		NW REGION TRAFFIC OPERATIONS	SHEETS
RECTONAL ADM	1	REVISION	I DATE LE	RY	•	P.F. STAMP ROX	P.E. STAMP BOX	1		<u> </u>



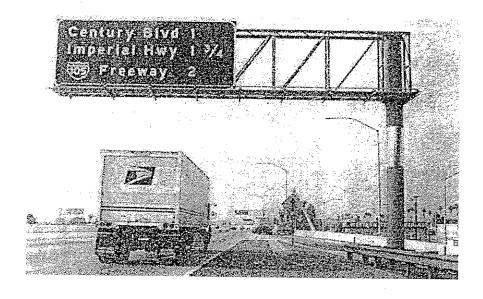


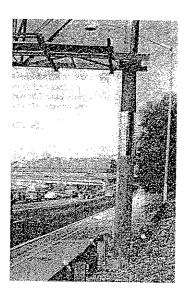




PRODUCT DESCRIPTION

NUGARD SHIELD IS A MECHANICAL DEVICE DESIGNED TO DETER UNAUTHORIZED INDIVIDUALS FROM GAINING ACCESS TO THE VARIOUS HIGHWAY, FREEWAY, AND STREET SIGNS. THE DESIGN OF NUGARD SHIELD IMPLEMENTS A FIELD OF BARBS ABOUT 3 FEET IN HEIGHT AND A LENGTH EQUAL TO THE OUTER CIRCUMFERENCE OF THE SIGN POST. IT IS TO BE INSTALLED AROUND THE POST, AT A DESIRABLE HEIGHT. THE CRITERIA FOR THIS HEIGHT MAY BE VISIBILITY AND MINIMIZATION OF IT'S CIRCUMVENTION (i.e. GAINING ACCESS TO A POLE HEIGHT BEYOND NUGARD SHIELD FROM ADJACENT TREES, WALLS, OR OTHER STRUCTURES); CONSEQUENTLY, WOULD-BE VANDALS ARE PREVENTED AND DETERRED FROM EVEN TRYING TO CLIMB UP THE POST DUE TO THE SHARP AND POINTED BARBS. ITS CIRCUMVENTION IS VIRTUALLY IMPOSSIBLE WITHOUT A SET OF SPECIALIZED TOOLS AND TIME, A LUXURY GRAFFITI DEFACERS AND OTHER VANDALS CANNOT TYPICALLY AFFORD.







NUGARD SHIELD IS MADE OF A FLAT PIECE OF GALVANIZED SHEET METAL, WITH A THICKNESS OF 15 MILS (0.015"). A HEIGHT OF APPROXIMATELY 36" AND A LENGTH EQUAL TO THE OUTER CIRCUMFERENCE OF THE POLE TO WHICH IT WILL BE ATTACHED. THE AREA-DENSITY OF THE MATERIAL IS 0.6 LBS/FT.

PROTRUSIONS (BARBS) WITH SHARP EDGES ARE CREATED THROUGHOUT THE SHEET BY A STAMPING PROCESS. THE PROTRUSIONS AVERAGE A DENSITY OF 64 SETS PER SOUARE FOOT, EACH SET MAY CONTAIN FROM 1 TO 4 BARBS DEPENDING ON THE TYPE OF DIE USED IN THE STAMPING PROCESS.

PRODUCT IDENTIFICATION

TRADE NAME: MODEL NUMBER/ID NO .:

NUGARD SHIELD

GENERIC:

CAL-TRANS TRACKING NO. 96-09-002 N/A

MANUFACTURER

NAME: ADDRESS:

DORIAN FILIPESCU AND BERNARDO LOPEZ, PARTNERS 1739 GLENDALE BLVD., LOS ANGELES, CA 90026

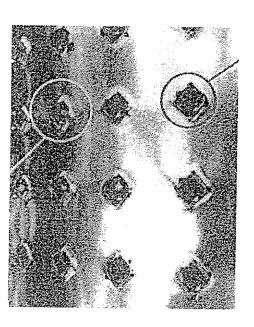
NOT TO PS&E QUALITY NOT TO SCALE

WSDOT-NORTHWEST REGION NΑ Approved Dave McCormick Region Traffic Engineer

NOTICE:

THE NWR TRAFFIC OPERATIONS GROUP HAS NOT INSTALLED ANY ANTI-GRAFFITI GUARDS ON MONOTUBE SIGN STRUCTURES TO DATE.

THE GRAFFITI GUARD SHOWN ON THIS PAGE IS AN EXAMPLE OF WHAT CAL-TRANS IS USING AS A POST COLLAR GRAFFITI GUARD.



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Washington State Department of Transportation

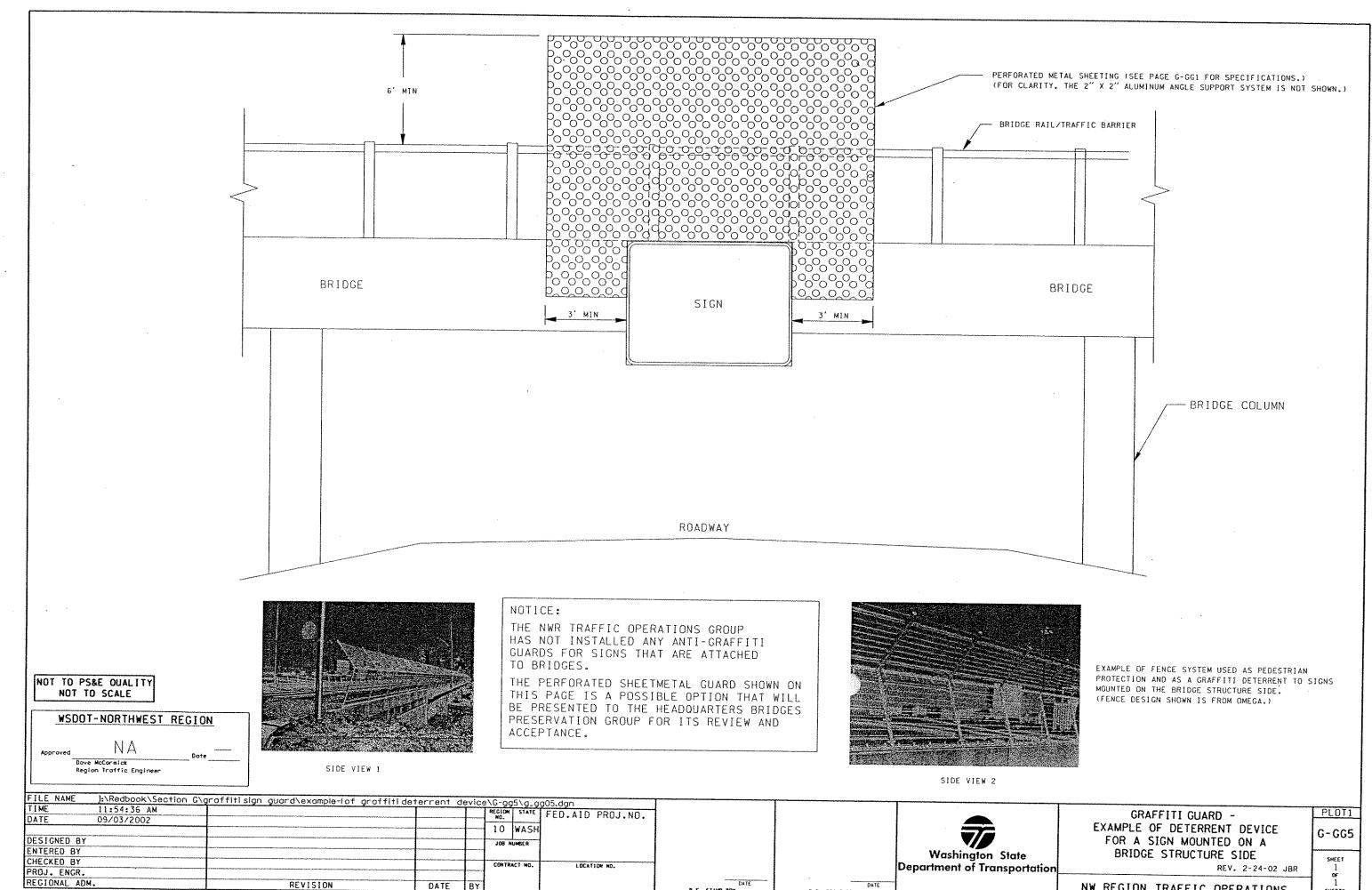
GRAFFITI GUARD -EXAMPLE OF A DIFFERENT TYPE OF GRAFFITI GUARD

REV. 2-24-02 JBR

NW REGION TRAFFIC OPERATIONS

PLOT1

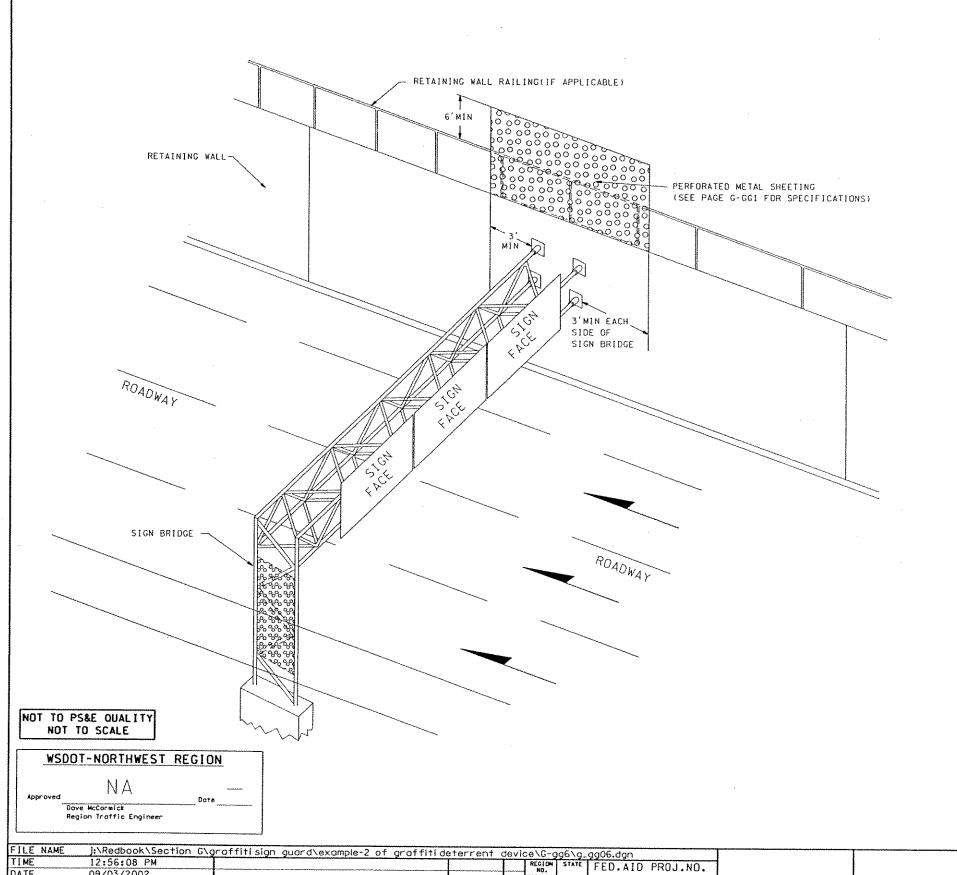
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P.E. STAMP BOX

NW REGION TRAFFIC OPERATIONS

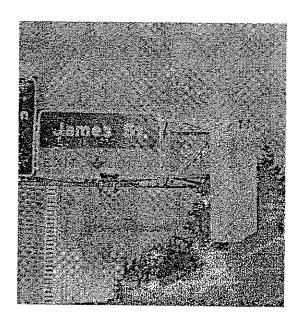
SHEETS



NOTICE:

THE NWR TRAFFIC OPERATIONS GROUP HAS INSTALLED SEVERAL DIFFERENT TYPES OF GRAFFITI GUARDS TO RETAINING WALL AREAS (BARBED WIRE, EXPANDED METAL, ETC.). THE DESIGNS USED TO DATE HAVE BEEN PARTIAL OR TOTAL FAILURES.

THE PERFORATED SHEETMETAL GUARD SHOWN ON THIS PAGE IS A POSSIBLE OPTION THAT WILL BE PRESENTED TO THE HEADQUARTERS BRIDGES PRESERVATION GROUP FOR ITS REVIEW AND ACCEPTANCE.



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DATE	09/03/2002			1			
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PROJ. ENGR.						j	
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GRAFFITI GUARDS EXAMPLE OF GRAFFITI DETERRENT
DEVICES FOR SIGN STRUCTURE
ATTACHED TO RETAINING WALL

REV. 2-24-02 JBR

NW REGION TRAFFIC OPERATIONS

SHEET

1

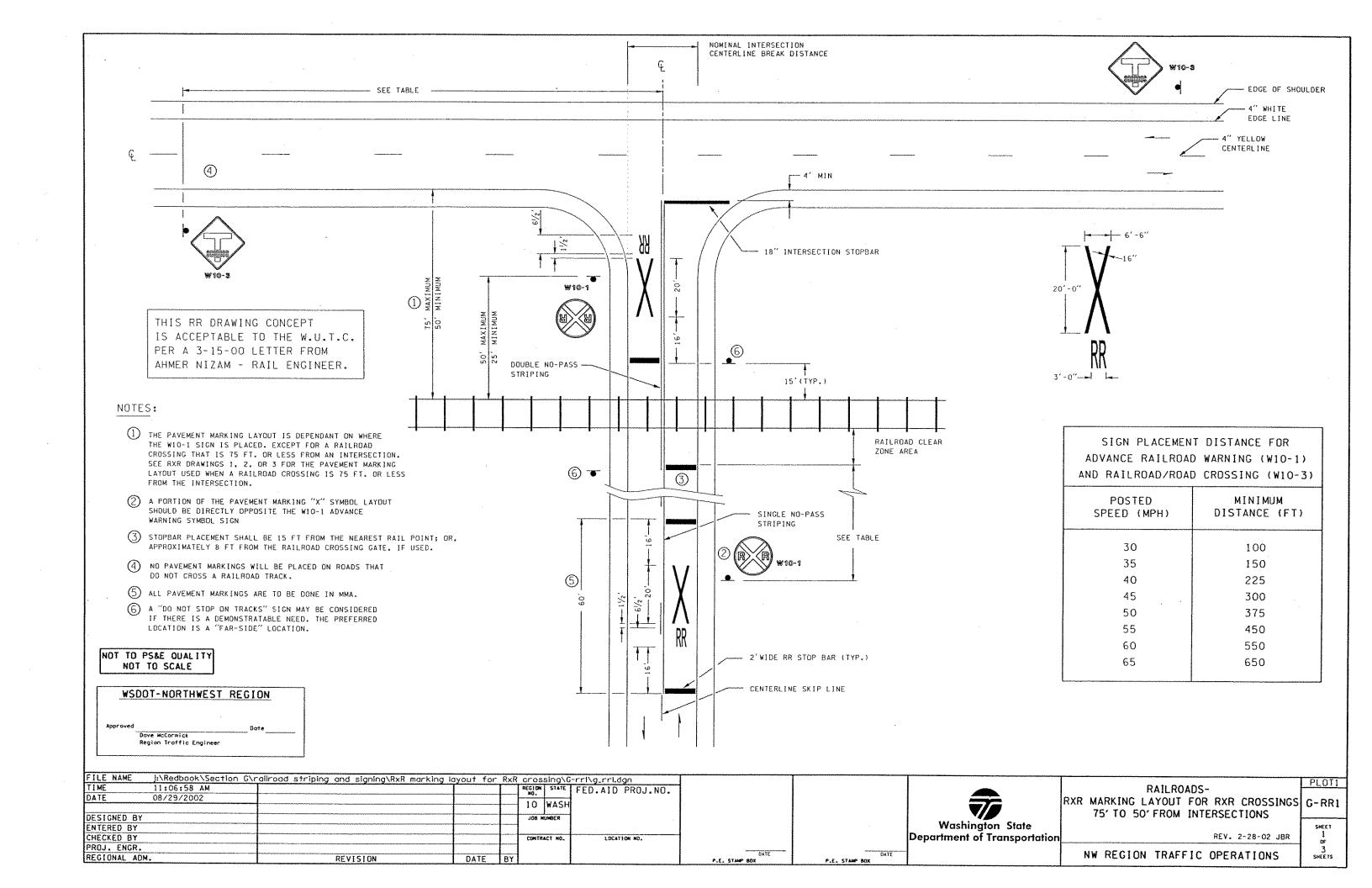
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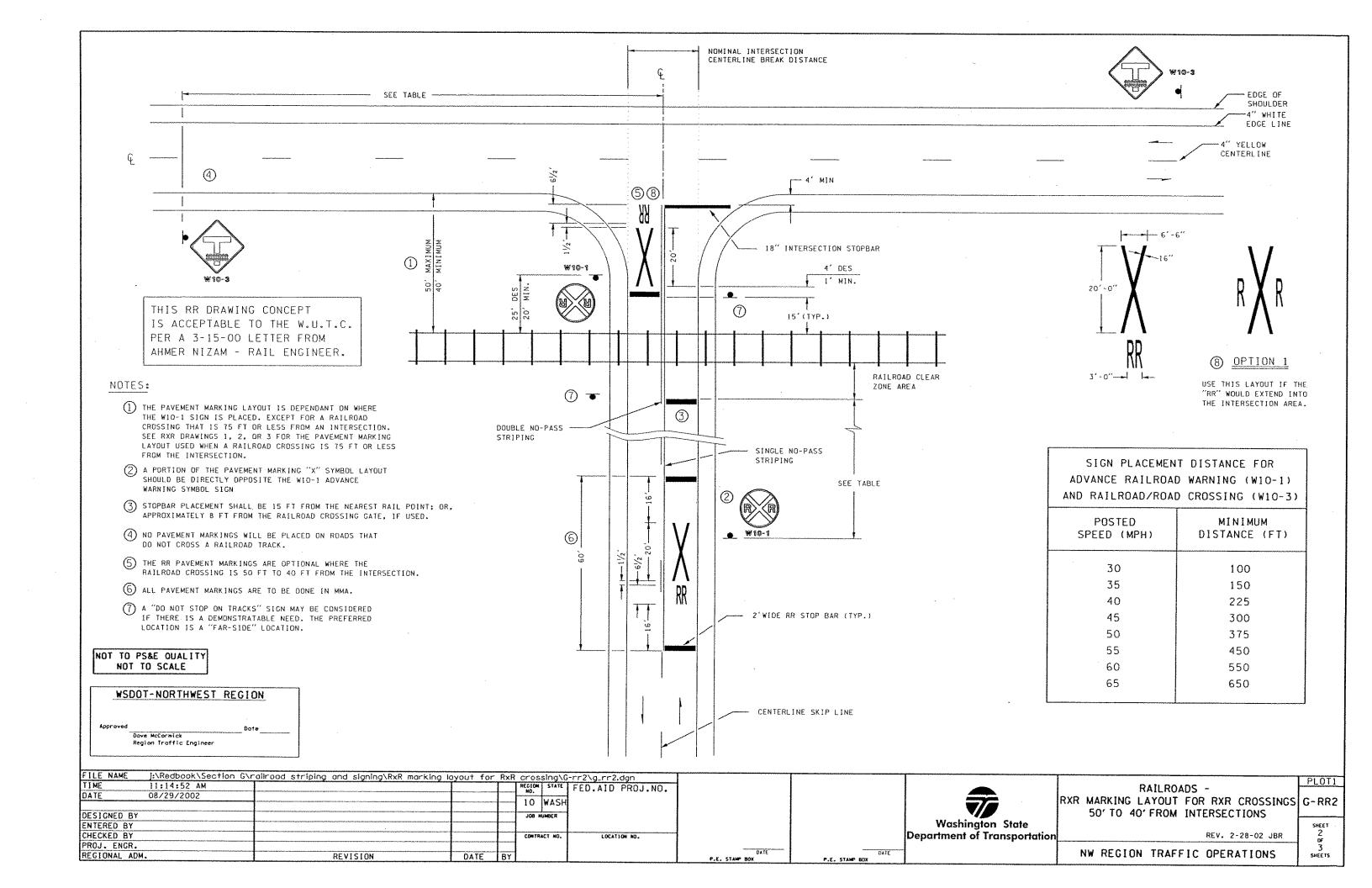
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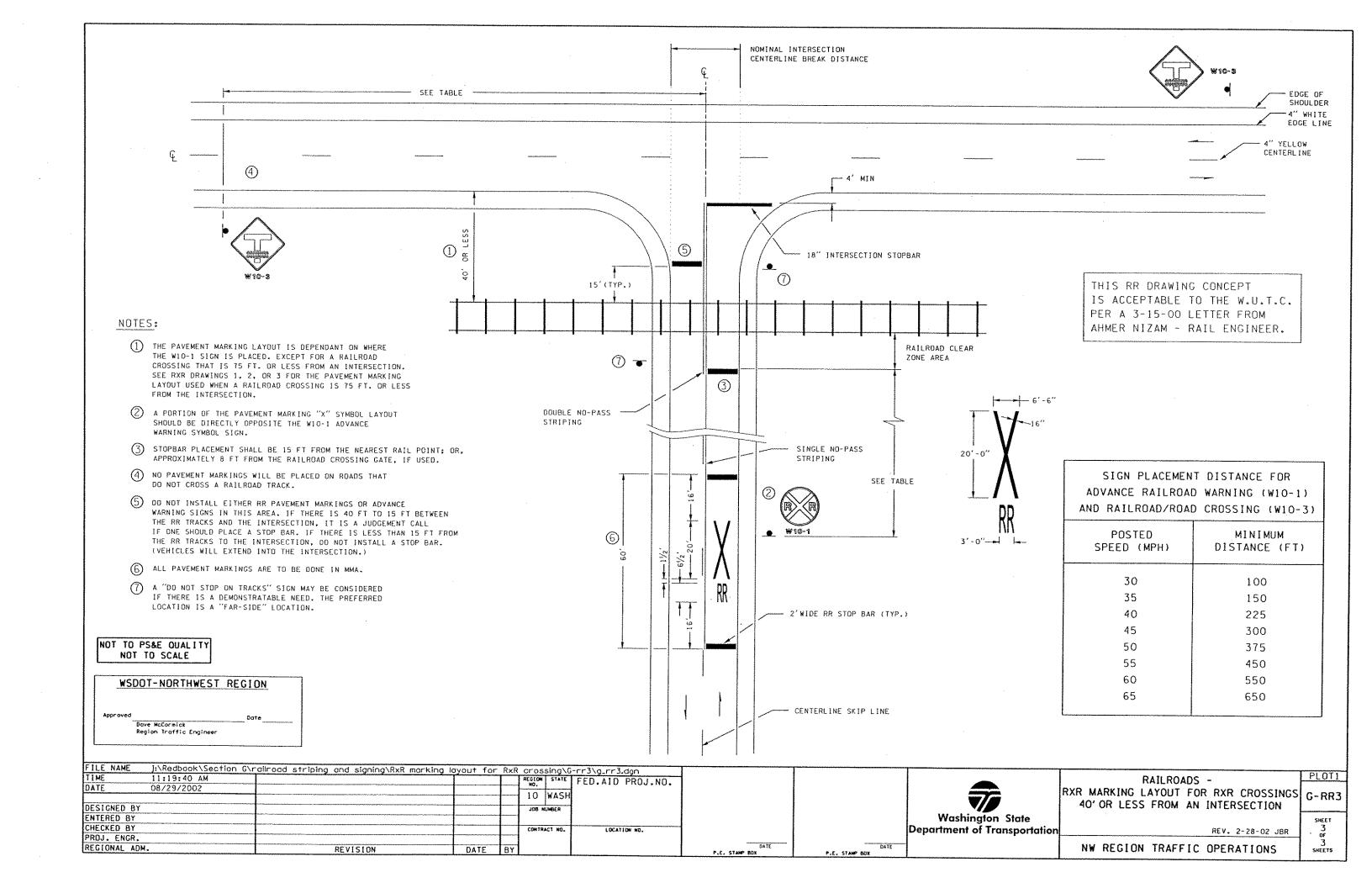
SHEETS

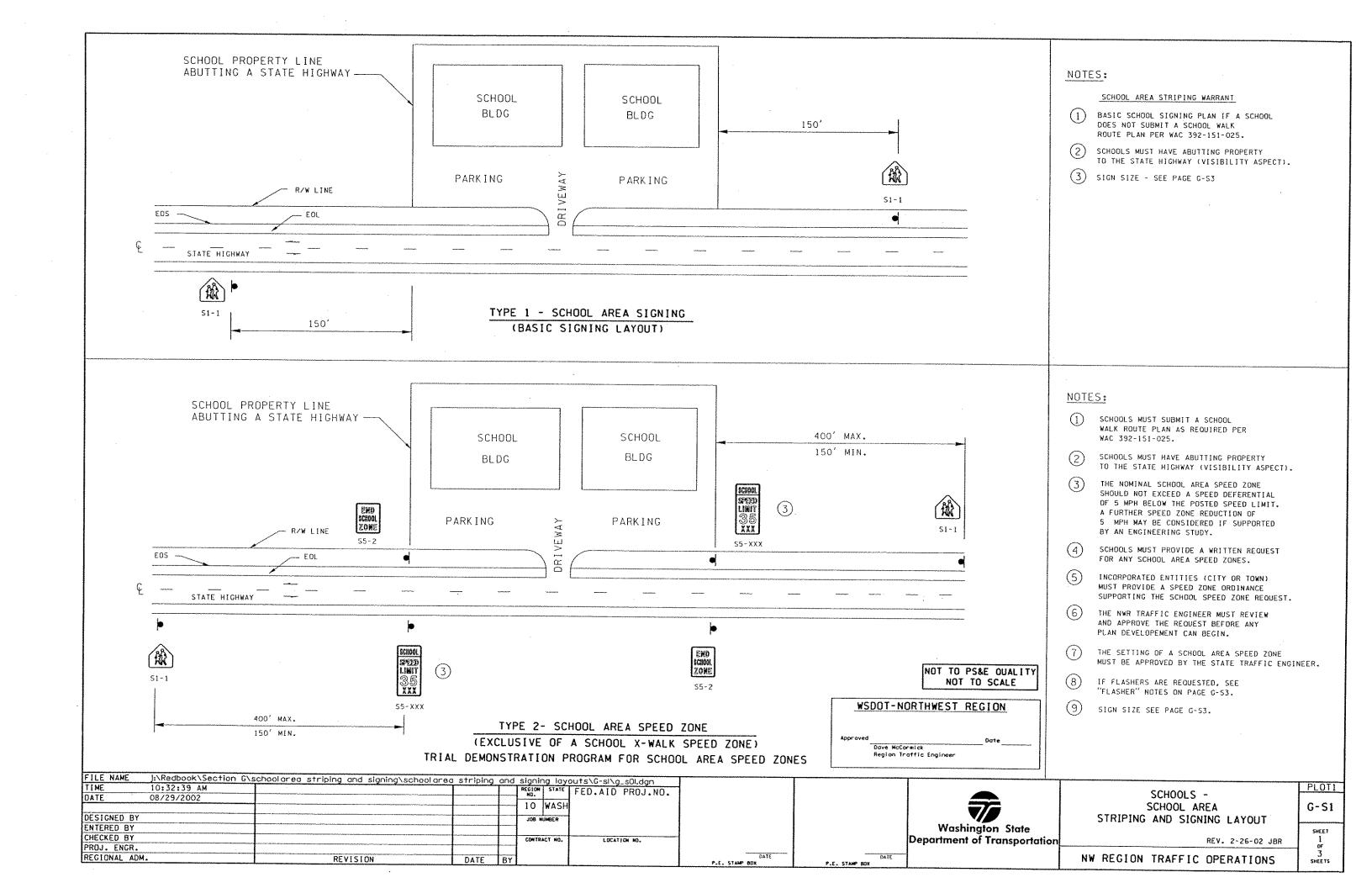
PLOT1

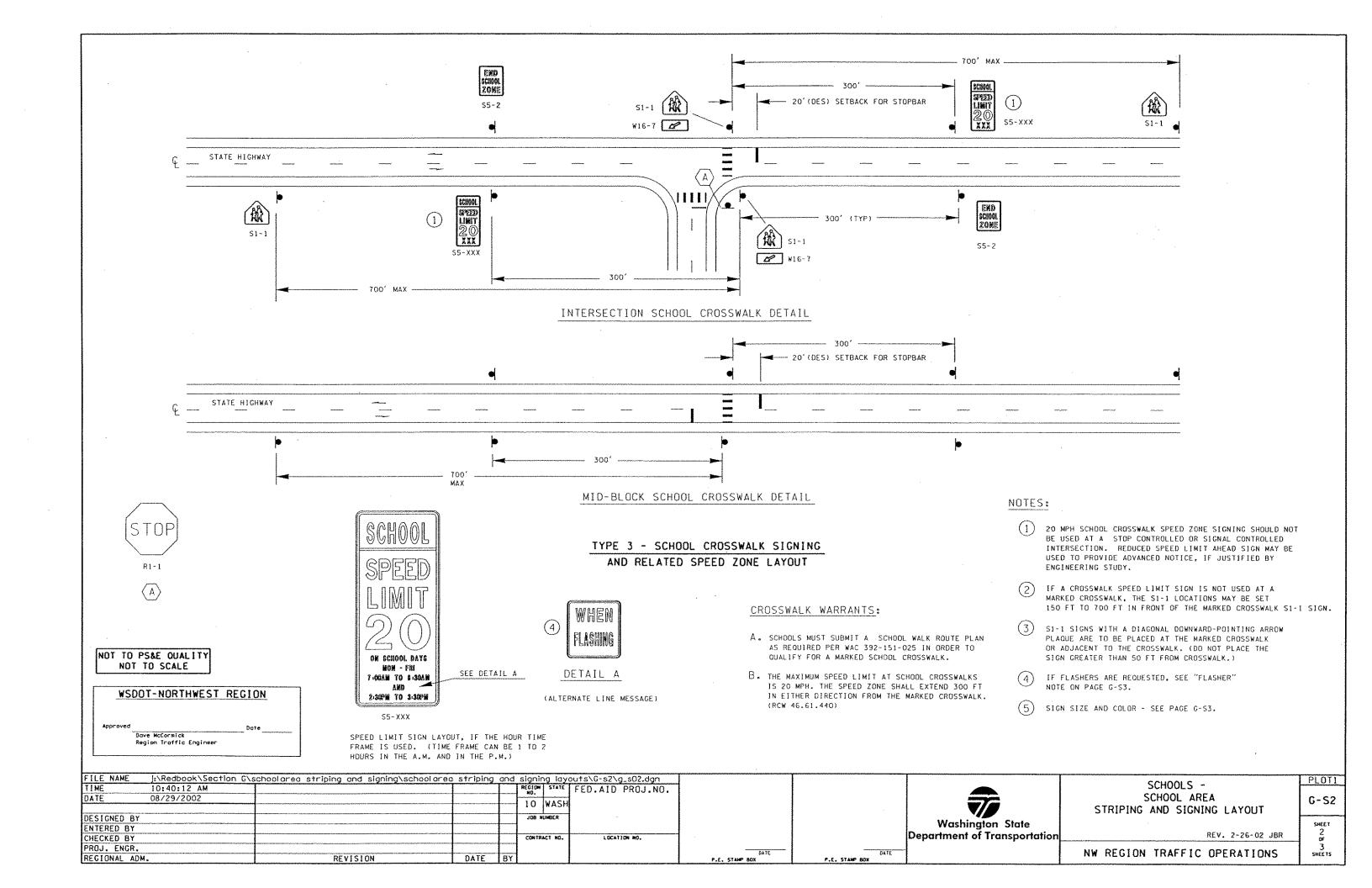
G-666



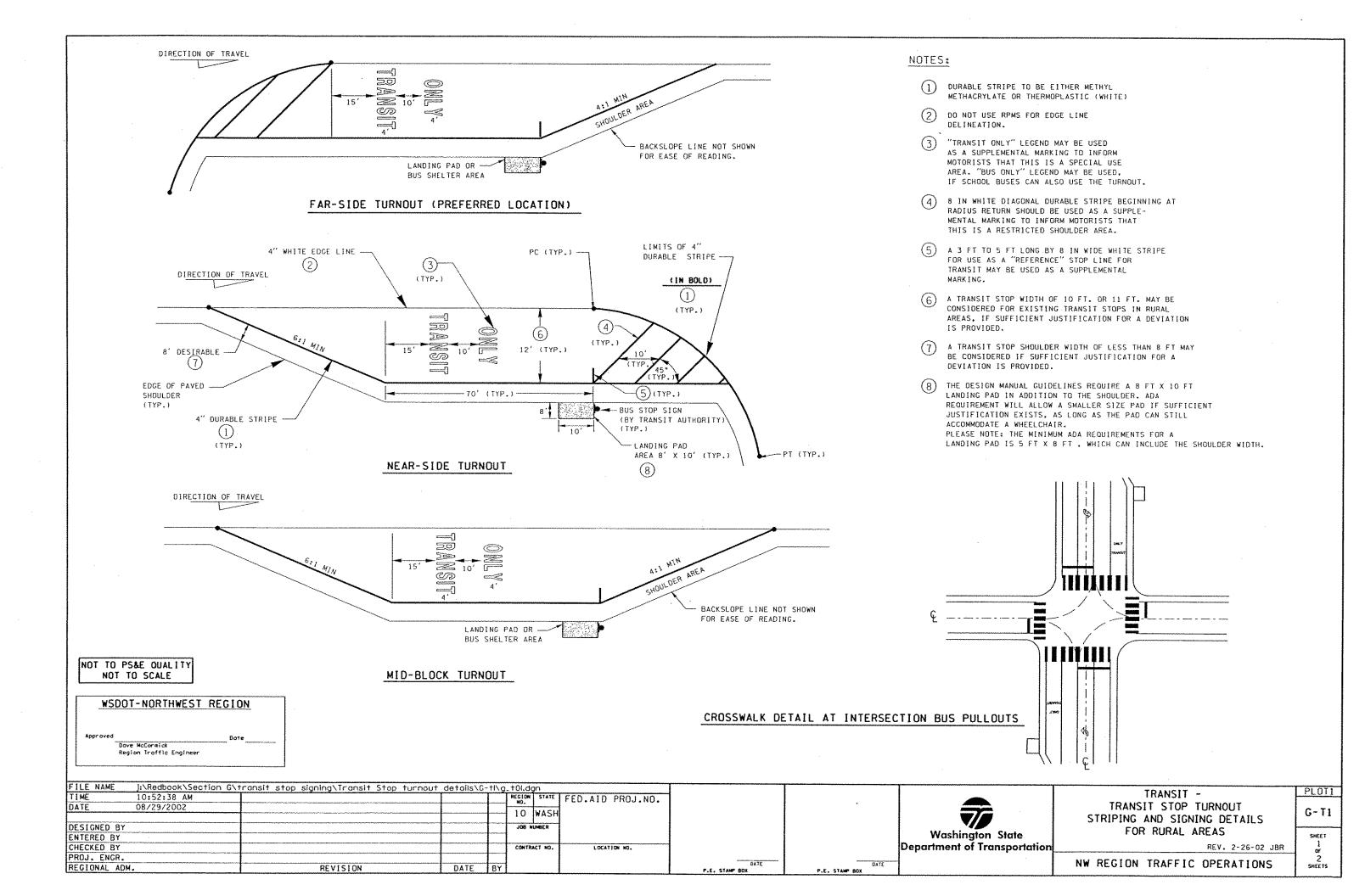






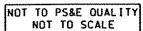


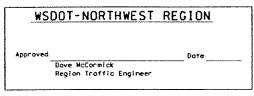
TRIAL DEMONSTRATION PROGRAM FOR SCHOOL BUS SPEED ZONES SCHOOL PROPERTY LINE SCHOOL ABUTTING A STATE HIGHWAY -SCHOOL SCHOOL PLAYGROUND BLDG BLDG BLDG SCHOOL SPEED LIMIT 35 EMD SCHOOL ZONE XXX PARKING PRINCIPAL DRIVEWAY S5-XXX R/W LINE 55-2 SCHOOL BUS DRIVEWAY SECONDARY DRIVEWAY 51-1 STATE HIGHWAY END SCHOOL ZOME - 150' - 400' SCHOOL 55-2 M SPED LIMIT \$1~1 XXX TYPE 4 - SCHOOL SPEED ZONE RELATED TO PRINCIPAL DRIVEWAY THAT "INCOMING A.M. AND OUTGOING P.M." SCHOOL BUSES USE SS-XXX NOTES: FLASHER GUIDELINES SCHOOLS MUST SUBMIT A SCHOOL BUS A. FLASHERS ARE CONSIDERED TO BE EXTRAORDINARY INCORPORATED ENTITIES (CITY OR TOWN) SPEED LIMIT SIGNS -- PLAQUE NOTES: ** ACCESS PLAN SHOWING BUS SAFETY DEVICES. FLASHERS MAY BE PROVIDED MUST PROVIDE A SPEED ZONE ORDINANCE PREFERRED SIGN PLAQUES (IN DESCENDING ORDER): ARRIVAL/DEPARTURE.TIME OF DAY. ETC. IF THE SCHOOL AGREES TO PAY FOR THE INITIAL SUPPORTING THE SCHOOL AREA BUS A. IF FLASHER IS USED: INSTALLATION COSTS AND ANY MAINTENANCE SPEED ZONE REQUEST. SCHOOLS MUST HAVE ABUTTING PROPERTY USE ONLY S4-4 "WHEN FLASHING" PLAQUE. COST VIA A J.A. ACCOUNT. IF A SCHOOL OPERATES TO THE STATE HIGHWAY. THE FLASHERS OUTSIDE OF THE AGREED TIME THE NWR TRAFFIC ENGINEER MUST REVIEW (VISIBILITY ASPECT) B. IF NO FLASHER IS USED: FRAME, IT WILL BE REMOVED. AND APPROVE THE REQUEST BEFORE ANY PLAN DEVELOPEMENT CAN BEGIN. "TIME" PLAQUE S4-1 (WITH HOURS SUCH AS THE NOMINAL SCHOOL AREA BUS SPEED SHOULDER MOUNT FLASHERS ARE THE PREFERRED 7:30 AM TO 5:30PM M-F) ZONE SHOULD NOT EXCEED A SPEED FLASHER LOCATIONS. II. USE S4-501 "WHEN FLAGGED" PLAQUE. DEFERENTIAL OF 5 MPH BELOW THE POSTED THE SETTING OF A SCHOOL AREA BUS S4-2 "WHEN CHILDREN ARE PRESENT" PLAQUE. SIGN SIZES: SPEED LIMIT. A FURTHER SPEED ZONE SPEED ZONE MUST BE APPROVED USE OF THIS PLAQUE APPLIES 7 DAYS A WEEK, REDUCTION OF 5 MPH MAY BE CONSIDERED BY THE STATE TRAFFIC ENGINEER. S1-1: CONVENTIONAL ROADWAYS: 24 HOURS A DAY. THE USE OF THIS PLAQUE IF SUPPORTED BY AN ENGINEERING STUDY. NOT TO PS&E QUALITY IS STRONGLY DISCOURAGED. STANDARD IS 36 IN x 36 IN FOR BOTH RURAL AND NOT TO SCALE THE FOLLOWING SIGNS WILL HAVE A SCHOOLS MUST PROVIDE A WRITTEN URBAN AREAS. THE MINIMUM SIZE IS 30 IN x 30 IN FLUORESCENT YELLOW-GREEN BACKGROUND REQUEST FOR A SCHOOL AREA BUS AND CAN BE USED FOR LOW SPEED AREAS WITH BLACK LEGEND AND BORDER: SPEED ZONE REQUEST. UNDER 35 MPH. WSDOT-NORTHWEST REGION a) 51-1 b) S4-3 EXPRESSWAYS AND FREEWAYS: c) W16-7 STANDARD SIZE IS 48 IN x 48 IN FOR BOTH Dave McCormick URBAN AND RURAL AREAS. Region Traffic Engineer FILE NAME j:\Redbook\Section G\schoolarea striping and signing\schoolarea striping and signing layouts\G-s3\g_s03.dgn PLOT1 REGION STATE FED. AID PROJ. NO. SCHOOLS -10:45:02 AM DATE 08/29/2002 SCHOOL AREA G-S3 10 WASH STRIPING AND SIGNING LAYOUT JOS HUMBER DESIGNED BY **Washington State** SHEET 3 ENTERED BY Department of Transportation REV. 2-26-02 JBR LOCATION NO. CONTRACT NO. CHECKED BY PROJ. ENGR. NW REGION TRAFFIC OPERATIONS SHEETS REGIONAL ADM. REVISION DATE P.C. STAMP BOX P.F. STAMP BOX

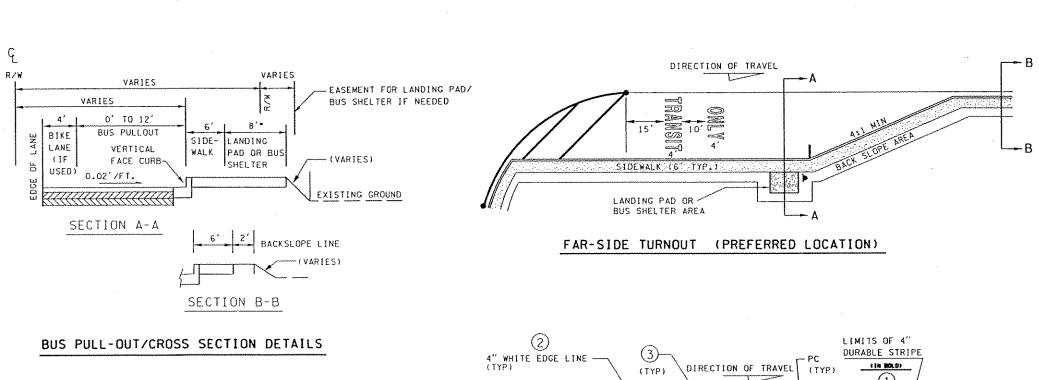


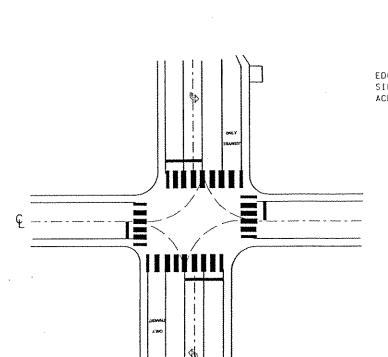
NOTES:

- 1 RADIUS RETURN AND STRIPING TO BE EITHER WHITE METHYLMETHACRYLATE OR THERMOPLASTIC (WHITE)
- 2 DO NOT USE RPMS FOR EDGE LINE
- "TRANSIT ONLY" LEGEND MAY BE USED
 AS A SUPPLEMENTAL MARKING TO INFORM
 MOTORISTS THAT THIS IS A SPECIAL USE
 AREA. "BUS ONLY" LEGEND MAY BE USED,
 IF SCHOOL BUSES CAN ALSO USE THE TURNOUT.
- 8 IN WHITE DIAGONAL DURABLE STRIPE BEGINNING AT RADIUS RETURN SHOULD BE USED AS A SUPPLE-MENTAL MARKING TO INFORM MOTORISTS THAT THIS IS A RESTRICTED SHOULDER AREA.
- (5) A 3 FT TO 5 FT LONG BY 8 IN WIDE WHITE STRIPE FOR USE AS A "REFERENCE" STOP LINE FOR TRANSIT MAY BE USED AS A SUPPLEMENTAL MARKING.
- (6) IF TRANSIT STOP SHELTER IS USED TRANSIT STOP SIGN MAY BE RELOCATED TO THE APPROACH SIDE OF THE SHELTER.
- 7) AT SIDEWALK END SECTIONS, INSTALL ACP WHEELCHAIR RAMP 12:1 SLOPE.
- THE DESIGN MANUAL GUIDELINES REQUIRE A B FT X 10 FT LANDING PAD IN ADDITION TO THE SHOULDER. ADA REQUIREMENT WILL ALLOW A SMALLER SIZE PAD IF SUFFICIENT JUSTIFICATION EXISTS. AS LONG AS THE PAD CAN STILL ACCOMMODATE A WHEELCHAIR. PLEASE NOTE: THE MINIMUM ADA REQUIREMENTS FOR A LANDING PAD IS 5 FT X B FT, WHICH CAN INCLUDE THE SHOULDER WIDTH.





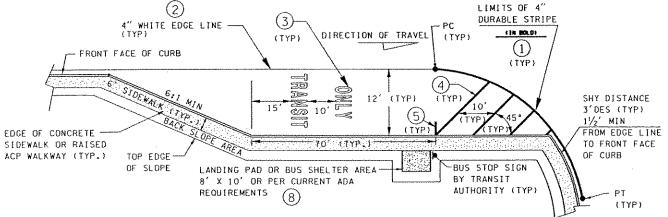




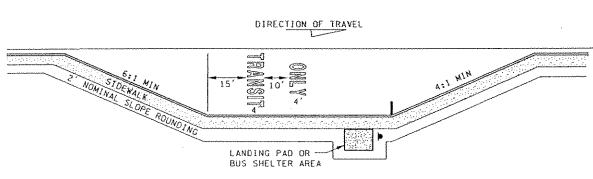


P.E. STAMP BOX

P.E. STAMP BOX



NEAR-SIDE TURNOUT

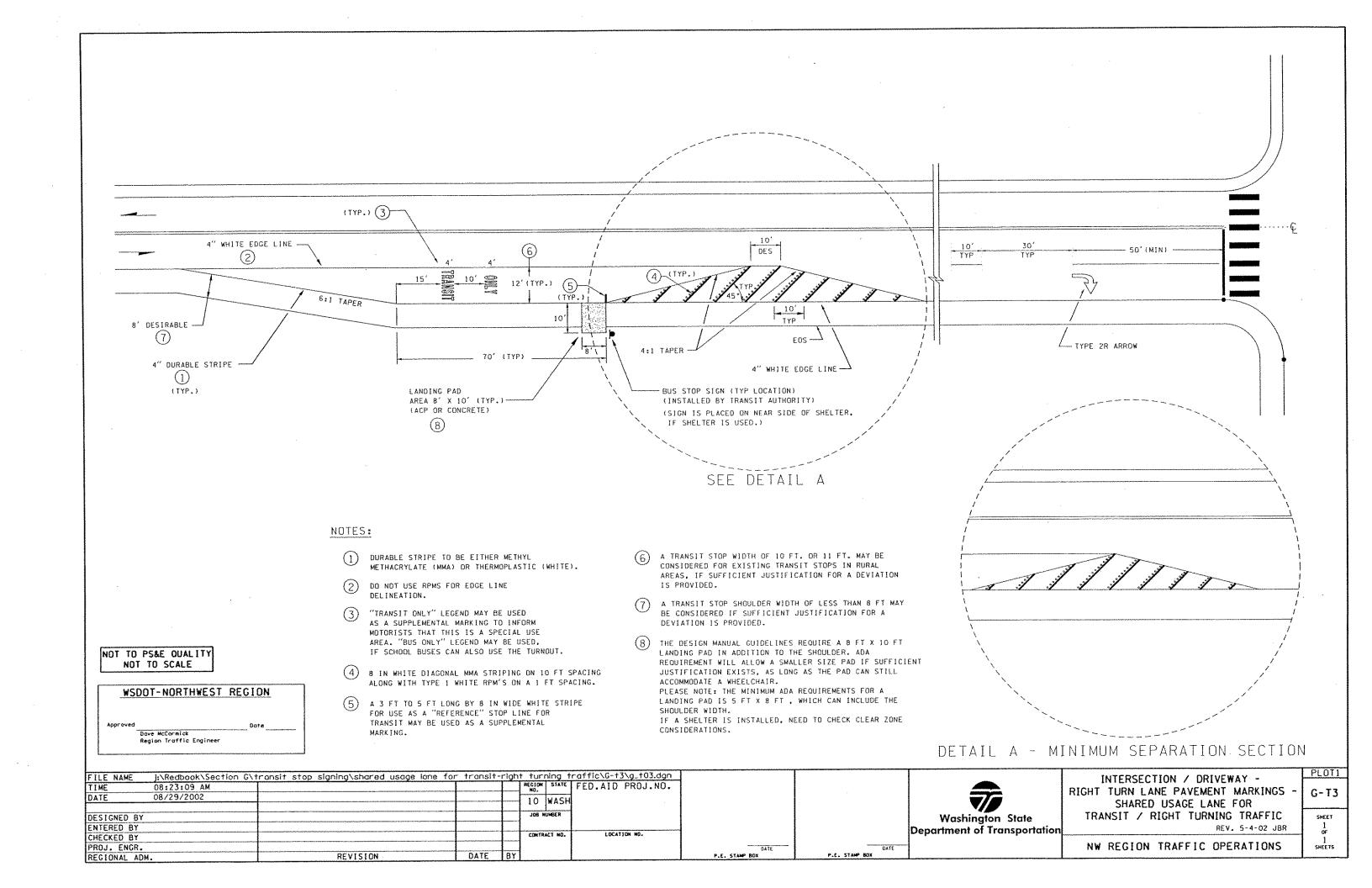


MID-BLOCK TURNOUT

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TIME	10:53:10 AM				REGEDN	STATE	FED.AID PROJ.NO.
DATE	08/29/2002				10	WASH	
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Washington State
Department of Transportation

TRANSIT TRANSIT STOP TURNOUT
STRIPING AND SIGNING DETAILS
FOR URBAN AREAS
REV. 2-26-02 JBR
NW REGION TRAFFIC OPERATIONS
SHEETS
SHEETS



NWR - Traffic Operations Group

General Striping Guidelines and Information

Rev. Date: February 25, 2001

Long-line Striping:

It is our goal to have all urban area roadway centerlines; lane lines and edge lines striped using durable (plastic) markings. The durable markings are listed in descending priority:

Profile Methyl Metacrylate (MMA) Flat Methyl Metacrylate (MMA) Profile Thermoplastic Flat Thermoplastic

The distance between profiles (bumps) shall be 2 feet for the white lane lines, white edge lines, gore lines and other locations where bicyclists may ride.

The distance between profiles (bumps) should be 2 feet for the yellow centerline. This distance could be reduced to 1 foot if there is a need for added noise. Consult the NWR Traffic Operations Group about this adjustment.

It is our goal to have all rural area roadway centerlines, lane lines and edge lines striped using durable (plastic) markings. The durable marking priority is the same as listed above and modified as follows:

Flat MMA should be the only durable product used in snow zone areas.

Flat MMA should be the only durable product used in the transition areas around the snow areas. The local maintenance area can provide additional information about the locations of the transition areas.

Raised Pavement Markings (RPMs):

- RPMs have a nominal service life of two years. Freeways, expressways and some multilane highway RPMs are usually replaced in the odd years. Conventional roadway and some multilane highway RPMs are replaced in the even years.
- During the two-year replacement cycle our goal is to replace all missing or damaged Type 2 (Reflective) RPMs. However, not all of the Type 1 RPMs may be replaced. If this is the case, we will stripe those areas with paint until such time as the missing Type 1 RPMs can be replaced.
- RPMs are usually installed on highways exclusive of snow zone areas and some transitional areas.

Recessed RPMs may be considered for the snow zone and transitional areas. Please note that the NWR Pavement Marking Group is not equipped to maintain recessed RPMs at the present time.

Maintenance for the Type I RPMs is becoming a problem in part due to the large number of Type I RPMs in use, their service life and their non-reflectivity. For these reasons, the NWR Traffic Section is requesting that all future NWR construction contracts consider the use of durable markings rather than RPMs for any long-line striping.

The use and replacement of Type 2 RPMs will continue as before.

Durable (Plastic) Pavement Markings:

All stop bars, pavement arrows, legends, symbols and crosswalk striping shall be done using MMA material. Thermoplastic material may be considered on a case by case basis for pavement arrows, legends and symbols outside of the snow zone and transitional areas subject to approval by the NWR Traffic Operations Group

Snow Zone Areas:

Snow Zone Areas:	
MA 1 - SR 542	MP 22.9 (SR 547/Kendall Junction) to the Mt. Baker Summit
MA 2 - SR 20	MP 84.0 (Russell Road Vicinity) to the region boundary
SR 530	MP 39.0 (310th St. I/S) to the SR 20 Junction (Rockport)
MA 3 - SR 2	MP 24.5 (Sultan vicinity) to the region boundary
MA 4 - SR 410	MP 26.0 (Weyerhaeuser Road vicinity) to the region boundary
MA 5 - SR 90	MP 17.0 (Front St in Issaquah) to the region boundary
SR 202	MP 21.8 (SR 203 Junction) to the I 90 I/C (in North Bend)
SR 203	MP 0.0 (SR 202 Junction) to MP 5.0 (Carnation)

Durable Material:

Thermoplastic material is called out as Type A material and MMA material is called out as Type D material in the Standard Specifications Sections 8-22 and 9-34.

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PROJ. ENGR.							
REGIONAL AD	м.	REVISION	DATE	BY			

NWR - Traffic Operations Group

General Signing Guidelines and Information

Rev. Date: February 25, 2001

General Information:

Sign installations are based upon the following general guidelines -

- Sign installations are usually restricted to the nearest and/or most direct interchange or intersection for the line message or logo destination shown on a specific sign.
- Sign installation layouts are based upon a signing hierarchy (priority).
- Sign installations, other than regulatory, warning and principal guide directional signs, will be evaluated based upon the remaining sign space left at an interchange or intersection after the aforementioned three sign types have been addressed..

Signing Hierarchy:

Hierarchy in descending priority -

1. Regulatory signs Warning signs

Sign spacing as required by law and where needed.

Sign spacing per the MUTCD Section 2C3, Table II-1.

2. Principal guide directional signs (white on green colors)

This type of sign is usually a three-sign layout for interchanges with a maximum of four line messages per sign, which includes symbols (such as highway number and directional arrows).

Shoulder mount sign installations may be used on conventional roadways. A sign location is based upon the mileage item shown on the sign message. If used, there should be an 800 ft spacing between this sign and any other highway sign for posted speeds of 55 mph or greater; and, a 500 ft spacing for posted speeds of 50 mph and under.

3-a.

Supplemental guide directional sign (white on green colors)

Normally one sign per interchange or intersection is allowed with a max. of four line messages per sign. Motorists Information Signs (MIS) (white on blue colors)

Signs may be generic or logos.

Layout priority in descending order of gas, food, lodging, camping, RV Park.

MIS Recreational (white on brown colors)

Tourists Oriented Directional Signs (TODS) (white on blue colors)

Visitor Information Sign (VIC) (white on blue colors)

Historical / Cultural Attractions (white on brown colors)

VIC and the Historical/Cultural Attractions may be combined on one sign.

800 ft sign spacing for posted speeds 55 mph or higher 500 ft sign spacing for posted speeds 50 mph or lower

3-b. HOV Regulatory Signs (black on white colors)

Initial sign layout at an interchange or intersection will be the same as noted for the Item 3-a sign spacing. Repeat signing will be done on one-mile intervals between interchanges for freeways and expressways. Repeat signing for conventional roadways will depend on the lengths between intersections.

4. Signs that are classified as minor signs such as highway safety awareness signs, river signs, stand alone Park and Ride Lot signs, HAR signs, etc. (sign colors will vary depending upon the sign type classification)

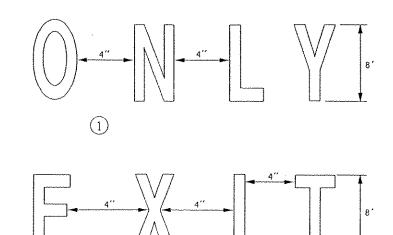
500 ft sign spacing for posted speeds 55 mph or higher

300 ft sign spacing for posted speeds 40 to 50 mph

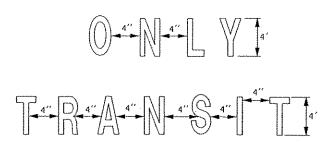
150 ft sign spacing for posted speeds 35 mph or lower

5. Signs that are not considered essentially highway signs can be offset from the normal signing layout without regard to sign spacing. These signs include Adopt-A-Highway, Mowing Test Area, Fire Danger/Fire District. Memorial Bridge Names, etc.

 ₹	GENERAL STRIPING AND SIGNING GUIDELINES AND INFORMATION	PL0T1 G-Z1
Washington State Department of Transportation	REV. 2-26-02 JBR	SHEET 1 OF
	NW REGION TRAFFIC OPERATIONS	2 SHEETS



FREEWAY / EXPRESSWAY - SPACING FOR LEGEND MARKINGS



TRANSIT LANE - SPACING FOR LEGEND MARKINGS

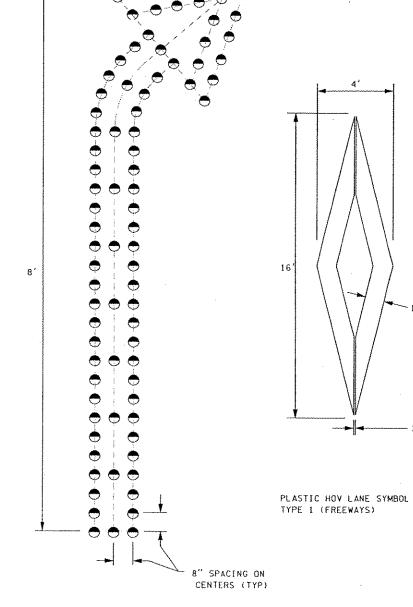
NOTES:

THE NWR PAVEMENT GROUP USES A 2 IN X 4
IN BLOCK TO SPACE OUT THE LETTERS. THERE
IS NO SPACE BETWEEN TH "L" AND THE "Y".

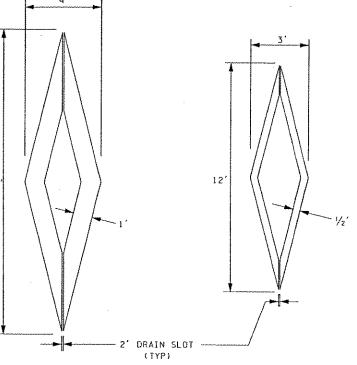
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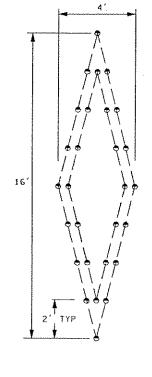
WSDOT-NORTHWEST REGION

Approved Dave McCormick
Region Traffic Engineer



P.E. STAMP BOX





BLACK

REVERSIBLE LANE DIAMONDS

TYP I UNIDIRECTIONAL MARKERS

PAVEMENT HOV SYMBOL DETAIL

PLASTIC HOV LANE SYMBOL

TYPE 2 (ARTERIALS AND RAMPS)

DIRECTION OF TRAVEL ON DESTRICTED LANG

FILE NAME	J:\Redbook\Section G\c	eneralstriping and signing pavement mark	ing\G-z2\c	J_Z02	.dan		
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REGIONAL ADM.		REVISION	DATE	ВҮ			

Washington State
Department of Transportation

DATE

P.E. STAMP BOX

GENERAL STRIPING AND SIGNING PAVEMENT MARKING DETAILS

REV. 3-6-02 JBR

NW REGION TRAFFIC OPERATIONS

G-Z2
SHEET
2
OF

PLOT1

